

Americas

## Surface Water Sampling Project-Specific HASP Addendum

**Location:** Portland Harbor Surface Water Sampling Study Area  
**Prepared By:** Linda Howard, Glen Mejia, Anthony Palmieri, Nicky Moody

**Date:** March 21, 2018  
**Approved By:** Jennifer Pretare (AECOM), Fred Merrill (AECOM)

### Summary of Surface Water Sampling

Surface water samples will be collected at seven transects using a PR2900 HVS coupled with an XAD cartridge and a vortex separator, owned and operated by Gravity. The sampling equipment will be operated from two aluminum research vessels (RV *Tieton* [32-foot] and RV *Cayuse* [26-foot]) operated by Gravity, a subcontractor to AECOM. AECOM staff will provide on-board oversight, document the sampling process, and conduct on-board sample processing of surface water samples. Sampling events will occur during the winter and summer. It is assumed that each vessel will average one transect per day during the late fall and winter sampling events, with shorter daylight hours, for a duration of 4 days.

### Task Leads and Supervisors

Organization	Job Title/Role	Name	Cell Phone
AECOM	Task Lead	Kristen Durocher	603-581-6608
AECOM	Site Safety Officer Project Field Coordinator	Nicky Moody	503-969-6310
Geosyntec	Project Field Coordinator	Keith Kroeger	503-701-4538
Geosyntec	Project Chemist	Julia Klens-Caprio	865-207-8081
AECOM	Project Chemist	Amy Dahl	206-519-7168

### Supplemental List of Personnel, Short-Service Employees (SSE), Subcontractors and their Safety Officers

(from Programmatic HASP Summary: the Project-Specific HASPs will list all short-service employees, including subcontractors that are scheduled to participate in Project activities)

Organization	Job Title/Role	Name	Cell Phone	SSEs and Safety Officers
Gravity	Gravity Project Manager	Shawn Hinz	425-281-1471	Safety Officer
Gravity	Captain	Mike Duffield	206-794-4994	
Gravity	Captain	Rene Trudeau	907-538-3890	

Organization	Job Title/Role	Name	Cell Phone	SSEs and Safety Officers
Gravity	Captain	Peter Jenkins	425-238-4833	
Gravity	Captain	John Schaefer	253-905-6634	
Gravity	Deckhands/Scientist	Jeff Wilson	425-591-2831	
Gravity	Deckhands/Scientist	Jeff Schut	208-340-9438	
Gravity	Deckhands/Scientist	Chad Furulie	425 922-0955	
AECOM	Scientist	Mark Tauscher	503-367-0089	
AECOM	Scientist	Michaela McCoog	207-329-9681	
AECOM	Scientist	Jeremy Haney	845-405-1512	SSE (Mentor: Nicky Moody)
AECOM	Scientist	Bruce Cassem	503-753-5025	
Geosyntec	Scientist	Jennifer Arblaster	802-355-5024	
Geosyntec	Scientist	Alison Clements	812-766-0888	

### Supplemental List of Hazard Materials

(from Section 3.7 Hazard Communications: Hazardous materials that may be encountered as existing environmental or physical/health contaminants will be addressed in the Project-Specific HASPs that will be appended to this Programmatic HASP. The Supervisor or Safety Officer will maintain copies of all SDS on-site and in Project-Specific HASPs appended to this HASP (as Attachment 1). SDS may not be available for locally obtained products, in which case an alternate form of product hazard documentation will be acceptable)

Hazard Materials
Methanol

Hexane is also listed in the SOP for decontaminating of SW sampling equipment. Include here and include SDS or specify that it is not planned for use.

Liquinox is also an irritant, and an SDS is typically kept on site where it is used. Include here and include SDS, or include dilution specifications if concentrated Liquinox will not be kept on site.

### Housekeeping and Personal Hygiene

(from Section 3.9 Housekeeping and Personal Hygiene: Designated Safety Officer for individual study (to be designated in Project-Specific HASPs)

Designated Safety Officer	Organization	Cell Phone
Nicky Moody	AECOM	503-969-6310

**Supplemental List of Competent Persons**

(from Section 5.3.1 Competent Persons: To be identified in the Project-Specific HASP Addendum)

Operations	Organization	Job Title/Role	Name	Cell Phone
Safe Vessel Operations	Gravity	Captain	Mike Duffield	206-794-4994
Safe Vessel Operations	Gravity	Captain	Rene Trudeau	907-538-3890
Safe Vessel Operations	Gravity	Captain	Peter Jenkins	425-238-4833
Safe Vessel Operations	Gravity	Captain	John Schaefer	253-905-6634

**Supplemental List of CPR/First Aid/AED Trained Personnel**

(from Section 12.4 CPR/First Aid/AED Trained Personnel that will be on-site will be identified in the Project-Specific HASPs for each study)

Organization	Job Title/Role	Name	Cell Phone	Training
AECOM	Site Safety Officer Project Field Coordinator	Nicky Moody	503-367-0089	CPR, First Aid, and AED
AECOM	Scientist	Mark Tauscher	503-367-0089	CPR, First Aid, and AED
AECOM	Scientist	Michaela McCoog	207-329-9681	CPR, First Aid, and AED
AECOM	Scientist	Bruce Cassem	503-753-5025	CPR, First Aid, and AED
Geosyntec	Scientist	Alison Clements	812-766-0888	CPR, First Aid, and AED

**HASP Addendum Attachments:**


**Attachment 1: AECOM Pre-Job Hazard Assessment**

**Attachment 2: Gravity Health and Safety and Environmental Plan**

**Attachment 3: Vessel Diagrams**

**Attachment 4: Safety Data Sheets**

**Attachment 1. AECOM Pre-Job Hazard Assessment**
**Pre-Job Hazard Assessment**
**S3AM-209-FM4**

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
List principal activities involved in the scope of work	Identify each safety or health hazard		Identify engineering and administrative controls and any specific Personal Protective Equipment (PPE) that is required	
ACTIVITY 1 – Mobilize personnel and equipment to study area. 	Traffic/driving hazards	10	<ul style="list-style-type: none"> <li>All AECOM drivers must have current driver awareness training (available on AECOM University).</li> <li>All drivers must have current, valid driver's license on their person.</li> <li>Complete pre-use visual inspection. Walk around the vehicle to inspect for potential hazards or mechanical issues before driving.</li> <li>Practice defensive driving and drive in a courteous manner.</li> <li>Seat belts must be worn by the driver and all passengers.</li> <li>Obey all speed limits.</li> <li>Drivers must not use cellular telephones or other communication devices such as two-way radios unless safely parked.</li> <li>Window surfaces must be cleared of any materials such as ice, frost, mud, or water that can impair visibility.</li> <li>Travel with headlights on at all times.</li> <li>Travel during daylight hours when possible.</li> <li>Equip vehicles with first aid kit, fire extinguisher, flares or triangle, spare tire and jack, cell phone.</li> <li>The project goal is to limit activities to no more than 10 hours/day; contact project manager if work days extend beyond the 10 hours.</li> </ul>	5
	Fatigue	15	<ul style="list-style-type: none"> <li>Extended workdays can be granted; however, workdays shall not exceed 14 hours and extended work weeks, 60 hours/week.</li> <li>For emergency work, a single shift should be limited to 16 hours, and an employee should be off work for at least 12 hours before the next shift starts. If shift work is required, employees should be given sufficient time to get a continuous 7- to 8-hour period of sleep in each 24 hours, and at least 50 hours every 7 days.</li> <li>Safety Officer and team members will watch and intervene when individuals appear to be fatigued; contact the project manager if a team member appears fatigued.</li> <li>Night work will not occur on this project.</li> <li>A journey management plan will be established for team members traveling &gt;250 miles.</li> </ul>	3
	Parking hazards	10	Park in a clear location, and back in to parking location to avoid backing out upon departure	3

**Attachment 1. AECOM Pre-Job Hazard Assessment**

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Lifting hazards/muscle strain	6	<ul style="list-style-type: none"> <li>Practice proper lifting and manual handling of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed.</li> <li>Wear abrasion gloves when moving equipment.</li> <li>No personnel should lift more than 40 pounds without assistance or mechanical aid. Know what items weigh before lifting or test them carefully.</li> </ul>	3
<b>ACTIVITY 2 – Load personnel and equipment onto vessel.</b>  Lifting hazards must be included under Activity 2 - load personnel and equipment onto vessel.	Lack of knowledge of tasks being performed	10	<ul style="list-style-type: none"> <li>Discuss tasks to be performed by personnel, potential hazards, and control measures.</li> </ul>	1
	Water hazards	10	<ul style="list-style-type: none"> <li>Follow all appropriate water safety rules and regulations.</li> <li>Wear Type III or V Personal Flotation Device (PFD) or life jacket.</li> </ul>	4
	Severe weather Reference where the "appropriate rules and regulations" are in this document or other document.	9	<ul style="list-style-type: none"> <li>Assess severe weather hazards using National Oceanic and Atmospheric Administration (NOAA) resources before on-water work.</li> <li>Stop work if lightning is &lt;6 miles away (&lt;30 seconds between lightning flash and hearing thunder). If storm is approaching, do not wait for it to arrive before implementing stop work action.</li> <li>Stop Work during wind gusts sustained at 25 mph, and at all times where debris is visible flying in air.</li> <li>Stop work during hail storms; seek shelter inside building or wheelhouse/vessel cabin.</li> </ul>	1
	Vessel boarding hazards	10	<ul style="list-style-type: none"> <li>Receive vessel operator's training prior to boarding vessel.</li> <li>Follow vessel operator's instructions for boarding vessel.</li> <li>Wear a Type III or V PFD or life jacket.</li> <li>Maintain three points of contact when boarding vessel.</li> <li>Follow vessel operator's instructions for loading equipment onto vessel.</li> </ul>	4
	Pinch points/hand injuries	8	<ul style="list-style-type: none"> <li>Be aware of hands, feet, arms, and position of all personnel during tool use and equipment handling. Never position a hand where it can be pinched. Examples of pinch point hazards include:               <ul style="list-style-type: none"> <li>Between lines under tension and hard surfaces</li> <li>Between vessel and dock</li> <li>Between equipment and hard surfaces on vessel</li> </ul> </li> </ul>	4
	Slips, trips, and falls	8	<ul style="list-style-type: none"> <li>Wear safety-toed boots with non-slip soles.</li> <li>Ensure pathways are clear and free of obstruction prior to initiating work, ensure all lines are secure prior to initiating work, and adhere to proper housekeeping practices.</li> <li>Maintain three points of contact when boarding vessel.</li> </ul>	4
<b>ACTIVITY 3 – Work aboard a research vessel on water.</b>	Slips, trips, and falls	8	<ul style="list-style-type: none"> <li>Wear appropriate safety-toed boots with non-slip soles.</li> <li>Ensure pathways are clear and free of obstruction prior to initiating work, ensure all lines are secure prior to initiating work, and adhere to proper housekeeping practices.</li> <li>Maintain three points of contact at all times.</li> </ul>	4

**Attachment 1. AECOM Pre-Job Hazard Assessment**

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
<p>Additional hazards include vessel colliding with submerged hazards (piling/rocks) and sudden stops and acceleration of the vessel. Control measures for these hazards must be added (e.g. chart review, visual observers, and pilot verbally announcing stops and starts).</p>	Fatigue	12	<ul style="list-style-type: none"> <li>Extended workdays can be granted; however, workdays shall not exceed 14 hours and extended work weeks, 60 hours/week.</li> <li>For emergency work, a single shift should be limited to 16 hours, and an employee should be off work for at least 12 hours before the next shift starts. If shift work is required, employees should be given sufficient time to get a continuous 7- to 8-hour period of sleep in each 24 hours, and at least 50 hours every 7 days.</li> <li>Safety Officer and team members will watch and intervene when individuals appear to be fatigued; contact the project manager if a team member appears fatigued.</li> <li>Night work will not occur on this project.</li> </ul>	2
	Lines and equipment under tension creating line of fire or pinch point	9	<ul style="list-style-type: none"> <li>Keep body away from lines under tension.</li> <li>Keep as much distance as possible between you and any source of potential energy release.</li> </ul>	2
	Moving parts/pinch points/hand injuries	9	<ul style="list-style-type: none"> <li>Be aware of hands, feet, arms, and position of all personnel during tool use and equipment handling.</li> <li>Never position a hand where it can be pinched if hatch closes, a load releases, or a tool slips.</li> </ul>	2
	Water hazards	10	<ul style="list-style-type: none"> <li>Vessel operator will provide a SH&amp;E Orientation on boating operations prior to departing dock, which will cover the following: man overboard, power loss/disabled boat, fire onboard, medical emergency.</li> <li>Vessel operator will perform a vessel inspection prior to departure.</li> <li>Vessel operator will submit a float plan to the Project Manager (Jenny Pretare) and follow the float plan and communication plan identified in the float plan.</li> <li>Passengers will obey Vessel Operator's orders at all times.</li> <li>Adhere to all federal, state, and local boating and licensing laws.</li> <li>Work must be performed in accordance with the "Buddy System."</li> <li>PPE: US Coast Guard (USCG)-approved Type III or V PFD or life jacket, sized and adjusted to the wearer, shall be worn by all workers when aboard the research vessel.</li> <li>Confirm vessel has secondary means of propulsion such as oars or paddles, backup motor.</li> <li>Workers are to remain seated when vessel is in motion. Avoid standing in vessel whenever possible.</li> </ul>	2

**Attachment 1. AECOM Pre-Job Hazard Assessment**

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Man overboard (MOB)/incapacitated person	10	<p>Vessel operator will provide a SH&amp;E Orientation on boating operations prior to departing dock, which will cover the following: MOB, power loss/disabled boat, fire onboard, medical emergency.</p> <p>Vessel operator will review USCG MOB procedures:</p> <ul style="list-style-type: none"> <li>• No low visibility/night operations will occur.</li> <li>• When deploying equipment, do not lean over the boat.</li> <li>• When boat is underway, all people must remain in the cabin, seated or standing, while maintaining four points of contact; no work on deck may occur.</li> <li>• All staff aboard vessel will be trained in MOB recovery training.</li> <li>• Perform safety briefing prior to departure and discuss MOB recovery procedure.</li> <li>• Wear Type III or V PFD AT ALL TIMES on board a boat or on dock.</li> <li>• Person who observes person fall overboard must keep their eyes on him/her.</li> <li>• Immediately cease work operations and commence a rescue procedure.</li> <li>• Bring the vessel to the position of the person in the water (as opposed to having the person swim to the boat).</li> <li>• Immediately mark MOB location on GPS by "one-button MOB press."</li> <li>• Throw a MOB pole marker/raise a MOB flag into the water to denote the location of the person overboard and to alert other boat traffic.</li> <li>• Throw PFDs or other floatable items into the water to assist the person overboard.</li> <li>• Send a distress call on VHF Channel 16 if person is un-responsive or severely injured.</li> </ul>	3
	Vessel in danger of sinking	10	<p>Vessel operator will be responsible for emergency actions and notifications; however, if the vessel crew is incapacitated the following procedure shall be followed:</p> <ul style="list-style-type: none"> <li>• Send a distress call: PAN call over VHF Channel 16 if boat is not in imminent danger.</li> <li>• Send a Mayday distress call and repeat until message is received over VHF Channel 16 if boat is in imminent danger. <ul style="list-style-type: none"> <li>○ Provide name of vessel.</li> <li>○ Provide description of vessel.</li> <li>○ Provide location of vessel (e.g., latitude/longitude, river mile, landmark, etc.)</li> <li>○ Provide count of onboard vessel passengers.</li> <li>○ Provide nature of distress.</li> <li>○ Describe kind of assistance needed.</li> </ul> </li> <li>• Turn on the bilge pump to begin pumping water to outside of boat.</li> <li>• Assemble the emergency pump and begin pumping water.</li> </ul>	4



**Attachment 1. AECOM Pre-Job Hazard Assessment**

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Vessel fire	10	<ul style="list-style-type: none"> <li>Remove all flammable material from ignition sources.</li> <li>Communicate with Site Safety Officer and vessel operator if there will be any new flammable material brought onboard; store only in approved containers. Review SDS for firefighting procedures.</li> <li>Review fire extinguisher location and quantity and confirm fire extinguishers are charged prior to leaving dock</li> <li>Remember P.A.S.S: <ul style="list-style-type: none"> <li>Pull the Pin</li> <li>Aim the fire extinguisher at the base of the fire</li> <li>Squeeze the handle</li> <li>Sweep the base of fire side to side</li> </ul> </li> <li>Send a Mayday distress call and repeat until message is received over VHF Channel 16 if boat is in imminent danger. <ul style="list-style-type: none"> <li>Provide name of vessel</li> <li>Provide description of vessel</li> <li>Provide location of vessel (e.g., Latitude/Longitude, River Mile, Landmark, etc.)</li> <li>Provide count of onboard vessel passengers.</li> <li>Provide nature of distress</li> <li>Describe kind of assistance needed.</li> </ul> </li> <li>Inflate life raft/abandon vessel if necessary (e.g., risk of explosion).</li> </ul>	3
	Medical emergency	8	<p>Vessel operator will review location of first aid kit and AED prior to departing the dock. The vessel operator or his/her designee will review how the AED operates with the crew prior to departing dock.</p> <ul style="list-style-type: none"> <li>Review first aid kit location and contents prior to departure.</li> <li>If a severe injury occurs, initiate a MAYDAY call.</li> <li>Travel to Swan Island or location identified by responding EMS</li> <li>After emergency has been addressed, contact project manager and AECOM reporting line (1-800-348-5046).</li> </ul>	2
	Heat stress/cold stress	9	<ul style="list-style-type: none"> <li>Begin heat stress/cold stress monitoring as applicable and continue throughout duration of task.</li> <li>Implement heat stress/cold stress prevention procedures, as applicable.</li> <li>Heat stress: Drink 8 oz water/hour and use appropriate work/rest schedule as specified in Heat Stress AECOM SH&amp;E Procedure.</li> <li>Cold Weather PPE (&lt;50 degrees F): <ul style="list-style-type: none"> <li>Layers of non-cotton clothing; examples include down, wool, or other synthetic materials to provide insulation when wet</li> <li>Outer layer to break the wind</li> <li>Hat or hardhat liner</li> <li>Insulated footwear/extra socks if boots allow</li> <li>Gloves that allow for insulation and dexterity</li> <li>Hand warmers</li> <li>Emergency set of dry clothing stored in waterproof bag.</li> </ul> </li> </ul>	5

**Attachment 1. AECOM Pre-Job Hazard Assessment**

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Severe weather	9	Assess severe weather hazards using NOAA resources before on-water work: <ul style="list-style-type: none"> <li>• Stop work if lightning is &lt;6 miles away (&lt;30 seconds between lightning flash and hearing thunder). If storm is approaching, do not wait for it to arrive before implementing stop work action.</li> <li>• Stop Work during wind gusts sustained at 25 mph, and at all times where debris is visible flying in air.</li> <li>• Stop work during hail storms; seek shelter inside building or wheelhouse/vessel cabin.</li> </ul>	1
	Other commercial/recreational vessel traffic hazards	10	<ul style="list-style-type: none"> <li>• Adhere to all federal, state, and local boating and licensing laws.</li> </ul>	3
ACTIVITY 4 – Locate sample locations using a differential global positioning system. Measure water depth at sampling station using a lead line.	Potential contaminant exposure	9	The decontamination procedure described in the field sampling plan and summarized below will be followed: <ul style="list-style-type: none"> <li>• Rinse equipment with river water.</li> <li>• Any water or sediment will be washed into the surface waters near the vicinity of the collection site before proceeding to the next station.</li> <li>• Liquinox (or alternate phosphate-free detergent-bearing liquid wastes from decontamination) will be used to decontaminate equipment which contacts sediment and will be washed overboard.</li> <li>• Rinse with distilled water.</li> <li>• Remove and dispose of nitrile gloves following decontamination procedure.</li> <li>• PPE: Nitrile gloves and chemical goggles. If splash hazard exists, disposable Tyvek or other impermeable clothing (e.g., rubber raingear) can be used, washed, and rinsed during the decontamination process.</li> <li>• Additional information is found in the Task-Specific Field Sampling Plan.</li> </ul>	3

**Attachment 1. AECOM Pre-Job Hazard Assessment**

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Man overboard (MOB)/incapacitated person	10	<p>Vessel operator will provide a SH&amp;E Orientation on boating operations prior to departing dock, which will cover the following: man overboard, power loss/disabled boat, fire onboard, medical emergency.</p> <p>Vessel operator will review USCG MOB procedures:</p> <ul style="list-style-type: none"> <li>• No low visibility/night operations will occur.</li> <li>• When deploying equipment, do not lean over the boat.</li> <li>• When boat is underway, all people must remain in the cabin, seated or standing, while maintaining four points of contact; no work on deck may occur.</li> <li>• All staff aboard vessel will be trained in MOB recovery training.</li> <li>• Perform safety briefing prior to departure and discuss MOB recovery procedure.</li> <li>• Wear Type III or V PFD AT ALL TIMES on board a boat or on dock.</li> <li>• Person who observes person fall overboard must keep their eyes on him/her.</li> <li>• Immediately cease work operations and commence a rescue procedure.</li> <li>• Bring the vessel to the position of the person in the water (as opposed to having the person swim to the boat).</li> <li>• Immediately mark MOB location on GPS by "one-button MOB press."</li> <li>• Throw a MOB pole marker/raise a MOB flag into the water to denote the location of the person overboard and to alert other boat traffic.</li> <li>• Throw PFDs or other floatable items into the water to assist the person overboard.</li> <li>• Send a distress call on VHF Channel 16 if person is un-responsive or severely injured.</li> </ul>	3

## Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
ACTIVITY 5 – Collect surface water samples using 1) Gravity's PR2900 HVS system and 2) a secondary peristaltic pump system. Both use paired tubing lowered to desired depth.  See previous comment on safety toe rubber boots	Man overboard (MOB)/incapacitated person	10	Vessel operator will provide a SH&E Orientation on boating operations prior to departing dock, which will cover the following: man overboard, power loss/disabled boat, fire onboard, medical emergency. Vessel operator will review USCG MOB procedures: <ul style="list-style-type: none"> <li>• No low visibility/night operations will occur.</li> <li>• When deploying equipment, do not lean over the boat.</li> <li>• When boat is underway, all people must remain in the cabin, seated or standing, while maintaining four points of contact; no work on deck may occur.</li> <li>• All staff aboard vessel will be trained in MOB recovery training.</li> <li>• Perform safety briefing prior to departure and discuss MOB recovery procedure.</li> <li>• Wear Type III or V PFD AT ALL TIMES on board a boat or on dock.</li> <li>• Person who observes person fall overboard must keep their eyes on him/her.</li> <li>• Immediately cease work operations and commence a rescue procedure.</li> <li>• Bring the vessel to the position of the person in the water (as opposed to having the person swim to the boat).</li> <li>• Immediately mark MOB location on GPS by "one-button MOB press."</li> <li>• Throw a MOB pole marker/raise a MOB flag into the water to denote the location of the person overboard and to alert other boat traffic.</li> <li>• Throw PFDs or other floatable items into the water to assist the person overboard.</li> <li>• Send a distress call on VHF Channel 16 if person is un-responsive or severely injured.</li> </ul>	3
	Potential contaminant exposure	10	<ul style="list-style-type: none"> <li>• Maintain awareness of potential contaminant exposure and implement avoidance procedures.</li> <li>• Use appropriate PPE, including nitrile gloves and safety glasses with side shields.</li> </ul>	3
ACTIVITY 6 – Sample processing: place filters in pre-labeled 8-ounce glass wide-mouth container with solids from PR2900 vortex separator (solids	Potential contaminant exposure	10	<ul style="list-style-type: none"> <li>• Maintain awareness of potential contaminant exposure and implement avoidance procedures.</li> <li>• Use appropriate PPE, including nitrile gloves and safety glasses with side shields.</li> </ul>	3

See previous comment on safety toe rubber boots

## Attachment 1. AECOM Pre-Job Hazard Assessment

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
<p>sample); cap and label XAD trap (dissolved phase sample). Place samples in Ziploc bags and store in cooler with ice. Unfiltered surface water samples will be transferred from the second pump system through tubing into a 20 liter glass carboy.</p> <p>Add broken glass as a potential sharps hazard w/ control measures including glass container handling/ storage and broken glass cleanup</p>	Risk of inhalation when handling acid and solvents used for cleaning high volume sampling supplies	9	<ul style="list-style-type: none"> <li>Project-specific Standard Operating Procedures (SOPs) for high-volume sampling are provided in Appendix B.</li> <li><b>Do not allow solvents and acids to sit in ambient air longer than needed for decontamination.</b></li> <li>Perform decontamination in area with high ventilation, away from ignition sources.</li> <li>Wear appropriate PPE, including nitrile gloves and safety glasses and/or chemical goggles.</li> <li>Monitor breathing space using PID. See Programmatic HASP for VOC action levels.</li> <li>Refer to chemical SDS for chemical specific PPE.</li> <li>Ensure adequate ventilation:               <ul style="list-style-type: none"> <li>Acetone PEL: 1000 ppm, ACGIH TWA: 250 ppm</li> <li>Methanol PEL: 200 ppm ACGIH: 200 ppm</li> <li>Hexane PEL: 500 ppm ACGIH: 50 ppm</li> </ul> </li> <li>Confirm emergency eyewash locations are located in close proximity to solvent handling area.</li> <li>Per SDSs, confirm safety shower is present and located near acid and solvent area.</li> </ul>	2
	Pinch hazards from tool	8	<ul style="list-style-type: none"> <li>When removing flat filters, solids, and XAD trap from the PR2900, open PR2900 fittings carefully. Use well-maintained and clean tools that are the correct size for the job.</li> <li>Do not force any fitting.</li> </ul>	4
	Safety and spill equipment		<ul style="list-style-type: none"> <li>A spill response kit, to include an appropriate empty container, materials to allow for booming or diking the area to minimize the size of the spill, and appropriate clean-up material (i.e., speedy dri, absorbent pads, etc.) will be available on the project study area and positioned for quick and easy access.</li> </ul>	
ACTIVITY 7 – Move samples off vessel by hand once docked.	Lifting hazards/muscle strain/ergonomic hazards	6	<ul style="list-style-type: none"> <li>Practice proper lifting and manual handling of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed.</li> <li>Wear abrasion gloves when moving equipment.</li> <li>No personnel should lift more than 40 pounds without assistance or mechanical aid. Know what items weigh before lifting or test them carefully.</li> <li>Transfer equipment to people on boat rather than carrying equipment onto boat.</li> </ul>	3
	Vessel offloading hazards	10	<ul style="list-style-type: none"> <li>Follow vessel operator's instructions for leaving vessel.</li> <li>Maintain three points of contact when leaving vessel.</li> <li>Follow vessel operator's instructions for transferring equipment and samples off vessel.</li> </ul>	5

**Attachment 1. AECOM Pre-Job Hazard Assessment**

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
See previous comment on safety toe rubber boots	Potential contaminant exposure	10	<ul style="list-style-type: none"> <li>Use proper tools for decontamination.</li> <li>Wear appropriate PPE, including nitrile gloves and safety glasses and/or chemical goggles.</li> <li>Follow other SOPs for decontamination as specified in the Task-Specific Field Sampling Plan.</li> </ul>	3
	Lifting hazards/muscle strain/ergonomic hazards	6	<ul style="list-style-type: none"> <li>Practice proper lifting and manual handling of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed.</li> <li>Wear abrasion gloves when moving equipment.</li> <li>No personnel should lift more than 40 pounds without assistance or mechanical aid. Know what items weigh before lifting or test them carefully.</li> <li>Transfer equipment to people on boat rather than carrying equipment onto boat.</li> </ul>	3
ACTIVITY 8 – Decontaminate equipment.	Lifting hazards/muscle strain	6	<ul style="list-style-type: none"> <li>Practice proper lifting and manual handling of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed.</li> <li>Wear abrasion gloves when moving equipment.</li> <li>No personnel should lift more than 40 pounds without assistance or mechanical aid. Know what items weigh before lifting or test them carefully.</li> </ul>	3
Decontamination in the FSP calls for use of Methanol (1L) and Hexane. Please clarify their use throughout this HASP addendum and include safety measures planned for handling and storage of these materials.	Potential contaminant exposure	10	<p>The decontamination procedure described in the Field Sampling Plan and summarized below will be followed:</p> <ul style="list-style-type: none"> <li>Rinse equipment with river water.</li> <li>Any water or sediment will be washed into the surface waters near the vicinity of the collection site before proceeding to the next station.</li> <li>Liquinox (or alternate phosphate-free detergent-bearing liquid wastes from decontamination) will be used to decontaminate equipment that contacts sediment and will be washed overboard.</li> <li>Rinse with distilled water.</li> <li>Remove and dispose of nitrile gloves following decontamination procedure.</li> <li>PPE: Nitrile gloves and chemical goggles. If splash hazard exists, disposable Tyvek or other impermeable clothing (e.g., rubber raingear) can be used, washed, and rinsed during the decontamination process.</li> <li>Additional information is found in the Task-Specific Field Sampling Plan.</li> </ul>	3
See previous comment on safety toe rubber boots				
ACTIVITY 9 – Load/transport samples to warehouse for processing.	Lifting hazards/muscle strain	6	<ul style="list-style-type: none"> <li>Practice proper lifting and manual handling of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed.</li> <li>Wear abrasion gloves when moving equipment.</li> <li>No personnel should lift more than 40 pounds without assistance or mechanical aid. Know what items weigh before lifting or test them carefully.</li> </ul>	3

**Attachment 1. AECOM Pre-Job Hazard Assessment**

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Driving hazards	10	<ul style="list-style-type: none"> <li>• All drivers must have current, valid driver's license on their person.</li> <li>• Complete pre-use visual inspection. Walk around the vehicle to inspect for potential hazards or mechanical issues before driving.</li> <li>• Practice defensive driving and drive in a courteous manner.</li> <li>• Seat belts must be worn by the driver and all passengers.</li> <li>• Drivers must not use cellular telephones or other communication devices such as two-way radios unless safely parked.</li> <li>• Window surfaces must be cleared of any materials such as ice, frost, mud, or water that can impair visibility.</li> <li>• Equip vehicles with first aid kit, fire extinguisher, flares or triangle, spare tire and jack, and cell phone.</li> <li>• Ensure all loads are properly secured.</li> </ul>	5
ACTIVITY 10 – Sample processing at warehouse  See previous comment on broken glass hazards	Lifting hazards/muscle strain	6	<ul style="list-style-type: none"> <li>• Practice proper lifting and manual handling of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed.</li> <li>• Wear abrasion gloves when moving equipment.</li> <li>• No personnel should lift more than 40 pounds without assistance or mechanical aid. Know what items weigh before lifting or test them carefully.</li> </ul>	3
	Potential contaminant exposure	10	<ul style="list-style-type: none"> <li>• Maintain awareness of potential contaminant exposure and implement avoidance procedures.</li> <li>• Use appropriate PPE, including nitrile gloves and safety glasses with side shields. Use proper tools for decontamination.</li> <li>• Wear appropriate PPE, including nitrile gloves and safety glasses and/or chemical goggles.</li> <li>• Use brushes, buckets, and bowls for decontamination.</li> <li>• Follow other SOPs for decontamination as specified in the Task-Specific Field Sampling Plan.</li> </ul>	3

**Attachment 1. AECOM Pre-Job Hazard Assessment**

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
ACTIVITY 11 – Demobilize at end of work shift.	Traffic/driving hazards	10	<ul style="list-style-type: none"> <li>All AECOM drivers must have current driver awareness training (available on AECOM University).</li> <li>All drivers must have current, valid driver's license on their person.</li> <li>Complete pre-use visual inspection. Walk around the vehicle to inspect for potential hazards or mechanical issues before driving.</li> <li>Practice defensive driving and drive in a courteous manner.</li> <li>Seat belts must be worn by the driver and all passengers.</li> <li>Obey all speed limits.</li> <li>Drivers must not use cellular telephones or other communication devices such as two-way radios unless safely parked.</li> <li>Window surfaces must be cleared of any materials such as ice, frost, mud, or water that can impair visibility.</li> <li>Travel with headlights on at all times.</li> <li>Travel during daylight hours when possible.</li> <li>Equip vehicles with first aid kit, fire extinguisher, flares or triangle, spare tire and jack, cell phone.</li> <li>The project goal is to limit activities to no more than 10 hours/day; contact project manager if work days extend beyond the 10 hours.</li> </ul>	5
	Fatigue	15	<ul style="list-style-type: none"> <li>Extended workdays can be granted; however, workdays shall not exceed 14 hours and extended work weeks, 60 hours/week.</li> <li>For emergency work, a single shift should be limited to 16 hours, and an employee should be off work for at least 12 hours before the next shift start. If shift work is required, employees should be given sufficient time to get a continuous 7- to 8-hour period of sleep in each 24 hours, and at least 50 hours every 7 days.</li> <li>Safety Officer and team members will watch and intervene when individuals appear to be fatigued; contact the project manager if a team member appears fatigued.</li> <li>Night work will not occur on this project.</li> <li>A journey management plan will be established for team members traveling &gt;250 miles.</li> </ul>	3



## Attachment 1. AECOM Pre-Job Hazard Assessment

## SPECIAL REQUIREMENTS

Step #	Equipment to be Used	Inspection Requirements	Training Requirements
	List equipment to be used in work activity	List inspection/permit requirements for work activity	List training requirements including hazard communication
1.	Research vessel	Perform boat inspection prior to use.  Complete and submit float plan prior to use.	USCG-licensed vessel operator or equivalent. MOB recovery with limited assistance. First Aid/CPR Training. Approved boating safety course.
2.	PR2900 HVS system and secondary peristaltic pump system	Perform equipment inspection requirements per Field Sampling Plan prior to use.	Employees operating equipment shall be experienced or trained in the specific use of the equipment for the purpose of the sampling effort.
3.	<p>Emergency equipment provided by vessel operator (Gravity):</p> <ul style="list-style-type: none"> <li>• GPS</li> <li>• Satellite phone (if cell phone service does not cover entire survey area)</li> <li>• VHF radios will remain on Channel 16 (for hailing/distress calls) at all times to listen for boat traffic, alerts, etc. unless actively keying/communicating on another channel with another party</li> <li>• Rescue rope in throw bag (commercially available)</li> <li>• Air horns and/or whistles</li> <li>• Waterproof flashlight</li> <li>• *Secondary "kicker" motor and *alternate means of propulsion (oars or paddles)</li> <li>• *Bailer (if bilge pump is not provided, bucket, or similar device should be on board)</li> <li>• *Duct tape</li> <li>• *Length of rope for securing boat on shore or alongside larger vessel</li> <li>• *Functional bilge pump/emergency pump</li> <li>• *Anchor with five to seven times as much line as the depth of water plus the distance from the surface of the water to where the anchor will attach to the bow</li> <li>• *Type 4 throwable ring or cushion</li> <li>• *Type BC fire extinguisher (10 pound) if extra fuel is carried in portable containers.</li> </ul> <p>* Required minimum equipment to be provided by vessel provider (chartered boat); project Field Coordinator to ensure remaining equipment is carried on board.</p>	Inspect all equipment for battery life and integrity during the pre-trip boat inspection.	Personnel should be familiar with all emergency equipment.

**Attachment 1. AECOM Pre-Job Hazard Assessment**

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## INSTRUCTIONS AND RISK MATRIX

**Hazard Evaluation** – Identify principal steps of the task. Identify potential safety/health hazards for each step and determine initial risk rating using the matrix provided below. Identify control measures including PPE for each hazard. Re-evaluate hazard potential and assign a final risk rating. If the final risk rating is a 5-9 (medium risk) or 10-25 (high risk), additional hazard controls shall be identified and applied until the final risk rating is reduced to 4 or below. The final risk rating cannot be reduced to 4 or lower, additional approvals are needed before the activity can begin. Add additional rows as required to cover all major steps/aspects of the activity.

**Special Requirements** – Identify equipment to be used including specific PPE required. Identify inspection requirements such as competent person, permit issue, documented task hazard analysis, etc. Identify training requirements such as hazard communication, scaffold user, fall protection, etc.

		High ←————→ Low				
High ↑ ↓ Low	Probability	Severity				
		5 - Catastrophic	4 - Critical	3 - Major	2 - Moderate	1 - Minor
	5 - Frequent	25	20	15	10	5
	4 - Probable	20	16	12	8	4
	3 - Occasional	15	12	9	6	3
	2 - Remote	10	8	6	4	2
	1 - Improbable	5	4	3	2	1
10-25 (red) are high risk, 5-9 (yellow) are medium risk, and 1-4 (green) are low risk						

Severity – Potential Consequences				
	People	Property Damage	Environmental Impact	Public Image/Reputation
Catastrophic	Fatality, Multiple Major Incidents	>\$1M USD, Structural collapse	Offsite impact requiring remediation	Government intervention
Critical	Permanent impairment, Long term injury/illness	>\$250K to \$1M USD	Onsite impact requiring remediation	Media intervention
Major	Lost/Restricted Work	> \$10K to \$250K USD	Release at/above reportable limit	Owner intervention
Moderate	Medical Treatment	> \$1K to \$10K USD	Release below reportable limit	Community or local attention
Minor	First Aid	</\$1K USD	Small chemical release contained onsite	Individual complaint

Probability		
Frequent	Expected to occur during task/activity	9/10
Probable	Likely to occur during task/activity	1/10
Occasional	May occur during the task/activity	1/100
Remote	Unlikely to occur during task/activity	1/1,000
Improbable	Highly unlikely to occur, but possible during task/activity	1/10,000

Risk Rating (Probability x Severity)	Risk Acceptance Authority
1 to 4 (Low)	Risk is tolerable, manage at local level
5 to 9 (Medium)	Risk requires approval by Operations Lead/Supervisor & SH&E Manager
10 to 25 (High)	Risk requires the approval of the Operations Manager & SH&E Director

# **HEALTH AND SAFETY AND ENVIRONMENTAL PLAN**

## ***Portland Harbor RI/FS 2018 studies***

***Gravity Consulting LLC***

***Updated February 2018***

Prepared for:

Prepared by:



Gravity Consulting L.L.C  
32617 SE 44<sup>th</sup> ST  
Fall City WA

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Gravity Consulting, L.L.C. Project Manager

Shawn Hinz

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Jeff Wilson, Gravity Consulting, L.L.C. Health and Safety Manager

The information in this Health and Safety Plan has been designed for the methods presently contemplated by Gravity Consulting L.L.C. (Gravity) for execution of the proposed work. Therefore, this document may not be appropriate if the work is not performed by or using the methods presently contemplated by Gravity. In addition, as the work is performed, conditions different from those anticipated may be encountered and this document may have to be modified. Therefore, Gravity only makes representations or warranties as to the adequacy of the Health and Safety Plan for currently anticipated activities and conditions.

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Appendix B – Health and Safety Logs and Forms
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Suggest updating appendix references throughout document to reference applicable document/appendix/other such as an appendix to the programmatic HASP or FSP. Some appendix material may need to be added if not included in other documents. This comment is applicable for all HASP addendum attachments.

## ***Acronyms and Abbreviations***

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ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
COC	Contaminants of Concern
CRZ	Contamination Reduction Zone
DOT	Department of Transportation
ERCP	Emergency Response and Contingency Plan
EZ	Exclusion Zone
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HSR	Health and Safety Representative
IDLH	Immediately Dangerous to Life or Health
JSA	Job Safety Analysis
LO/TO	Lockout/Tagout
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PHSM	Project Health and Safety Manager
PM	Project Manager
PPE	Personal Protective Equipment
REL	Recommended Exposure Limits
SHSO	Site Health and Safety Officer
SM	Site Manager
SS	Site Supervisor
SSO	Site Safety Officer
SZ	Support Zone
TLV	Threshold Limit Values



## **1.0 Introduction**

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This Health and Safety Plan's (HASP) objective is to help establish safe working conditions at the site Portland Harbor Study Site. Safety procedures and protective equipment are chosen according to potential hazards. Specific hazard control methods have been evaluated and selected to minimize the potential of accident or injury.

This HASP prescribes the procedures that must be followed during specific site activities. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager (PM) and the Project Health and Safety Manager (PHSM).

The provisions of this plan are mandatory for all personnel and subcontractors assigned to the project. All visitors to the work site must abide by the requirements of this plan. All project participants will attend a pre-job briefing where the contents of this HASP will be discussed. Project staff assigned to this project must sign the Agreement and Acknowledgement Sheet (see Appendix A) to confirm that they understand and agree to abide by the provisions of this plan.

All work will comply with the Occupational Safety and Health Act (OSHA) standard, "Hazardous Waste Operations and Emergency Response" (29 CFR 1910.120) and other federal, state, and local procedures that require the development and implementation of a HASP. Generation of this document certifies that the workplace has been evaluated for hazards. A hazard assessment has been performed and the adequacy of the personal protective equipment (PPE) selected was evaluated as required by 29 CFR 1910.132(d), 1910.134, 1926.25, and 1926.55, and is duly noted by the signature(s) and date appearing on the cover page of this document.

### **1.1 Site Description/Background Information**

The PDI study area encompasses the in-river portion of an approximately 27-mile stretch of the Willamette River within Portland Harbor, from approximately RM 1.9 to RM28.4. Project specific information is included in the AECOM Sampling and Analysis plan and HASP.

### **1.2 Scope of Work**

This plan addresses health and safety issues involved with environmental monitoring, sediment, and water characterization.

### **1.3 Key Safety Personnel**

The following people share responsibility for health and safety at the site. See Section 1.3.1 for a description of the role and responsibility of each.

Gravity Project Manager:	Office: 425-888-8256
Shawn Hinz.	Cellular: 425-281-1471
Gravity Site Supervisor:	Office: 206-905-9617
Chad Furulie	Cellular: 206-649-6033
Gravity Site Health and Safety Officer:	Office: 206-905-9617
Jeff Wilson	Cellular: 206-905-9617

### **1.3.1 Responsibilities of Key Personnel**

#### **1.3.1.1 Project Manager**

The PM has authority to direct response operations; the PM assumes total control over site activities. In addition, the PM:

- Prepares and organizes background review of the project, the work plan, and the field team.
- Obtains permission for site access and coordinates activities with appropriate officials.
- Briefs the Site Supervisor (SS), Site Health and Safety Officer (SHSO), and field personnel on specific assignments.
- Together with the SS and SHSO, sees that health and safety requirements are met.
- Consults with the PHSM regarding unsafe conditions, incidents, or changes in site conditions or the scope of work.

#### **1.3.1.2 Site Supervisor**

The SS Reports to the PM, has authority to direct response operations, and assumes control over on-site activities. In addition the SS:

- Conducts daily safety meetings.
- Executes the work plan and schedule.
- Manages the construction operations.
- In conjunction with the SHSO, conducts periodic field health and safety inspections to ensure compliance with this HASP.
- Enforces safety procedures.
- Coordinates with the SHSO in enforcing worker protection levels.
- Enforces site control.
- Notifies, when necessary, local public emergency officials.
- In conjunction with the SHSO, responsible for following-up on incident reports to the PM.

#### **1.3.1.3 Site Health and Safety Officer**

The SHSO advises the PM and SS on all aspects of health and safety on site. The SHSO stops work if site operations threaten worker or public health and safety and informs the PHSM of any changes in site conditions or project status. In addition, the SHSO:

- Conducts periodic inspections to assess whether the HASP is being followed.
- Periodically inspects protective clothing and equipment.
- Sees that protective clothing and equipment are properly stored and maintained.
- Controls entry and exit at the access control points.
- Performs air monitoring in accordance with this HASP. Maintains and oversees operation of monitoring equipment and interpretation of data from the monitoring equipment.

- Monitors workers for signs of stress, including heat stress, cold exposure, and fatigue.
- Enforces the “buddy” system.
- Is informed of emergency procedures, evacuation routes, and telephone numbers of the local hospital, poison control center, fire department, and police department.
- Notifies, when necessary, local public emergency officials.
- Communicates incidents promptly to SS and PM.
- Maintains communication with PHSM on site activities.
- If applicable, ensures decontamination and disposal procedures are followed.
- Maintains the availability of required equipment.
- Advises appropriate health services and medical personnel of potential exposures.
- Notifies emergency response personnel in the event of an emergency. Coordinates emergency medical care.

#### ***1.3.1.4 Project Health and Safety Manager***

The specific duties of the HSM include:

- Providing technical input into the design and implementation of the site HASP
- Advising on potential for worker exposure to project hazards along with appropriate methods and/or controls to eliminate site hazards.
- Ensures that a hazard assessment has been performed and the adequacy of the personal protective equipment (PPE) selected was evaluated as required by 29 CFR 1910.132(d), 1910.134, 1926.25, and 1926.55, and is duly noted by the signature(s) and date appearing on the cover page of this document

#### ***1.3.1.5 Work Team***

The Work Team reports to the SS for on-site activities and is responsible for:

- Safely completes on-site tasks required to fulfill the work plan.
- Complies with the HASP.
- Attends and participates in daily safety meetings.
- Notifies the SS and SHSO of suspected unsafe conditions.
- Reports all incidents to the SS and SHSO.

### ***1.4 Health and Safety Training Programs***

This Section describes the health and safety training programs that site personnel must comply with.

#### ***1.4.1 Medical Surveillance and Respirator Fit Testing***

This program tracks the physical condition of the company's employees in compliance with Occupational Safety and Health Administration (OSHA) standards (29 CFR 1910.120(e)), and the International Marine Contractors Association (IMCA) requirements for non-marine crew working in the offshore zone .

Medical surveillance and Physicals will consist of the following:

- Current medical clearance to conduct hazardous waste field work and to wear a respirator.
- Yearly physicals by offshore trained physician – see Appendix B for medical certifications

### **1.4.2 Training**

Training requirements and programs will comply with the OSHA Hazardous Waste Operations and Emergency Response regulation, 29 CFR 1910.120. Training requirements will consist of the following:

- Field personnel must complete a minimum of 40 hours of hazardous waste activity instruction.
- Field personnel must complete a minimum of three days of supervised field instruction.
- Field personnel assigned to the site will also receive 8 hours of refresher training each year.
- On-site managers and supervisors directly responsible for employees engaged in hazardous waste operations will receive an additional 8 hours of supervisory training.
- Field personnel assigned to site will also receive first aid/CPR and blood borne pathogen training.
- Other training may be required depending on the task to be performed (e.g., confined space, excavation/trenching, underground storage tank removal, fall protection, respiratory protection, and hazard communication).

### **1.4.3 Initial Orientation**

Hazardous Waste Operations Initial Health and Safety Orientation will consist of the following:

- All project participants engaged in site operations will attend an initial site orientation where this HASP will be discussed and followed. Personnel will acknowledge having been given the orientation by signing the agreement and acknowledgement form in Appendix A.

## 2.0 Hazard Analysis

Any change in the scope of work will require an amendment to this HASP. Any task conducted beyond the scope of work identified in this HASP must be evaluated using the Job Safety Analysis (JSA) process prior to conducting the work.

### 2.1 Job Safety Analysis

Common Gravity work tasks have been evaluated for their hazards and JSA documents developed which detail the chemical, physical and biological hazards associated with these tasks along with the control measures (engineering, administrative and/or personal protective equipment) that will be used to ensure that these tasks are conducted in a safe manner.

The PM and SS will be responsible for identifying work tasks and project site conditions that are beyond the previously developed JSA documents, and for communicating such information to the PHSM. The PHSM will work with the PM and SS to develop project specific JSAs or provide guidance in the development of JSAs to meet the identified project hazards.

If work tasks are identified during the course of the project which were not previously addressed in the JSA documentation supplied in Appendix C of this HASP then a task-specific JSA document shall be developed at the project site prior to conducting the work. The SS and SHSO shall develop this document(s) with input from the PM and PHSM as needed. Project personnel shall be trained on the contents of the developed task-specific JSA prior to its implementation. A copy of the task-specific JSA form used in this process is supplied in Appendix B of this HASP.

### 2.2 Hazard Communication Procedures

The purpose of hazard communication (Employee Right-to-Know) is to ensure that the hazards of all chemicals located at this field project site are communicated according to 29 CFR 1926.59 to all Gravity personnel and Gravity subcontractors. Personnel must follow the hazard communication procedures listed in Sections 2.3.1 and 2.3.2 when handling corrosive materials.

#### 2.2.1 Corrosive Material Handling Procedures

Corrosive materials include acids and bases. They are extremely corrosive materials with a variety of uses. Acids include hydrochloric, nitric, and sulfuric acids. Bases include sodium hydroxide. Observe the following procedures when working with corrosive materials:

- Wear gloves and eye-splash protection while using acid dispensed from a small dropper bottle during water sampling.
- Wear a full-face, air-purifying respirator equipped with combination cartridges (organic vapor/acid gas) as well as Tyvek coveralls and nitrile gloves for large volume applications.
- Have an eyewash bottle and/or portable eyewash station on site.
- Do not add anything into a virgin chemical drum, including unused product.
- Avoid mixing strong acids and bases. Consult the PHSM for task-specific evaluation. If mixing is absolutely necessary, do it slowly. Avoid vapors or fumes that are generated.
- When diluting acids, add the acid to water in small quantities and mix cautiously.
- When diluting bases, add water to the base in small quantities and mix cautiously.

correct references. Double check all document references for accuracy.

If corrosive materials are proposed, include SDSs and specify where/when they will be used. If not, remove this section.

Include procedures relevant to Methanol and hexane, including storage.

## **2.2.2 Hazard Communication Program**

### **2.2.2.1 Container Labeling**

Gravity personnel will ensure that all drums and containers are labeled according to contents. These drums and containers will include those from manufacturers and those produced on site by operations. All incoming and outgoing labels shall be checked for identity, hazard warning, and name and address of responsible party.

### **2.2.2.2 Employee Information and Training**

An ongoing corporate training program will train employees on chemical hazards. In addition, chemical hazards will be communicated to employees through daily safety meetings and by an initial site orientation program. At a minimum, Gravity and related subcontractor employees will be instructed on the following:

- Chemicals and their hazards in the work area.
- How to prevent exposure to these hazardous chemicals.
- What the company has done to prevent workers' exposure to these chemicals.
- Procedures to follow if they are exposed to these chemicals.
- How to read and interpret labels and MSDS for hazardous substances found on Gravity sites.
- Emergency spill procedures.
- Proper storage and labeling.

### **3.0 Project Hazards and Controls**

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In addition to the Task-Specific JSAs described in the previous section, Section 3 of this HASP lists the health and safety procedures and practices applicable to this project. For additional information, consult with your health and safety professional.

#### **3.1 Daily Safety Meetings**

Daily safety meetings make accident prevention a top priority for everyone and makes them aware of important accident prevention techniques. Observe the following daily safety meetings procedures and practices:

- Daily safety meetings will be held each morning prior to site activities
- The tailgate meeting form in Appendix B will be used to document the meeting.

#### **3.2 Physical Hazards and Controls**

##### **3.2.1 General Site Activities**

- Observe the following general procedures and practices:
- Legible and understandable precautionary labels shall be affixed prominently to containers of potentially contaminated soil, water, and clothing.
- No food or beverages shall be present or consumed in a Contamination Reduction Zone (CRZ) or Exclusion Zone (EZ). These are only allowed in designated areas of the support zone.
- No tobacco products shall be present or used, and cosmetics shall not be applied in a CRZ or EZ. These are only allowed in designated areas of the support zone, if areas have been designated.
- Beards, facial hair, or other facial obstructions that interfere with respirator fit will preclude admission to the EZ when respirators are required.
- An emergency eyewash unit shall be located immediately adjacent to employees who handle hazardous or corrosive materials, including decontamination fluids. All operations involving the potential for eye injury, splash, etc., must have approved eyewash units locally available capable of delivering at least 0.4 gallons per minute for at least 15 minutes.
- All on-site activities will be conducted during daylight hours. If work after dusk becomes necessary due to an emergency, adequate lighting must be provided and notification of such activity made to the location contact.
- Hazardous work, such as handling hazardous materials and heavy loads, and equipment operation, etc., should not be conducted during severe storms.
- All temporary electrical power must have a ground fault circuit interrupter (GFCI) as part of its circuit if the circuit is not part of permanent wiring. All equipment must be suitable and approved for the class of hazard present.

##### **3.2.2 Slip/Trip/Fall**

Observe the following procedures and practices to prevent slips/trips/fall:

- Inspect each work area for slip/trip/fall potential prior to each work task.

- Slip/trip/fall hazards identified must be communicated to all personnel. Hazards identified shall be corrected or labeled with warning signs to be avoided.
- All personnel must be aware of their surroundings and maintain constant communication with each other at all times.

### **3.2.3 General Falls/Ladders**

Observe the following general falls/ladders procedures and practices:

- Assess work areas for fall hazards. A fall protection system is required if work is conducted six feet or over.
- Use Type 1A rated ladders.
- Make sure ladder rungs are sturdy and free of cracks.
- Use ladders with secure safety feet.
- Pitch ladders at a 4:1 ratio.
- Secure ladders at the top or have another person at the bottom to help stabilize it.
- Ladders used to access an upper landing surface shall extend at least three feet above the upper landing surface.
- Do not use ladders for access to air stripper towers above six feet. Instead, use aerial lift.
- Use non-conductive ladders near electrical wires.
- The top step of a stepladder should not be used as a step.
- Do not carry any object or load that could cause a loss of balance or a fall.

### **3.2.4 Boating Operations**

The following precautions shall be followed when conducting boating trailer and launch activities:

- Follow trailer/boat manufacturer's instructions for securing boat to trailer
- Follow trailer/boat manufacturer's instructions for securing boat trailer to towing vehicle
- Prohibit workers from moving into trailer/vehicle pinch points without advising vehicle operator
- Use experienced operators when backing trailers on boat ramps
- Wear proper work gloves when the possibility of pinching, or other injury may be caused by moving/ handling large or heavy objects
- Maintain all equipment in a safe condition
- Wear reflective warning vests when exposed to vehicular traffic
- Launch boats one at a time to avoid collisions
- Use a spotter for vehicles backing boats to launch area
- Understand and review hand signals
- Wear boots with non-slip soles when launching boats
- Wear USCG approved flotation devices when working on/near water
- Keep ropes and lines coiled and stowed to eliminate trip hazards



- Maintain 3 point contact on dock/pier ladders

The following precautions shall be followed when conducting boating operations:

- Wear USCG Approved personal flotation devices for work activities on or near water
- Provide a floating ring buoy with at least 90 feet of line in the immediate boat launch/land areas
- Step into the center of the boat
- Keep your weight low when moving in the boat
- Move slowly and deliberately
- Steer directly across other boat wakes at 90 degree angle to avoid capsizing
- Steer boat facing forward
- Watch for floating objects in the water
- Right-of-way is yielded to vessels on your boat's right (and vessels with limited ability to maneuver)

The following precautions shall be followed when working on a boat:

- Observe proper lifting techniques
- Obey sensible lifting limits (60 lb. maximum per person manual lifting)
- Use mechanical lifting equipment (pulleys, winches) to move large, awkward loads
- Wear USCG Approved personal flotation devices for work activities on or near water

The following safety related items shall be available when conducting boating operations:

This conflicts with the  
JHA and programmatic  
HASP (40 lbs).  
Change to be 40 lbs.

**Table 3-2****Safety Equipment Specific to In-Water Work**

Reference table in main text and clarify if these safety measures are being implemented. Parts of this conflict with the rest of this HASP addendum and the programmatic HASP. Reference where these requirements are published by the USCG.

Additional Safety Equipment for Sampling Vessel per US Coast Guard Requirements:	
<ul style="list-style-type: none"> <li>• Proper vessel registration, numbering, and documentation (registered with state, certificate of vessel registration number displayed, and carry valid certificate of number)</li> <li>• USCG approved Personal Flotation Devices (PFDs/life jackets) for every person on sampling vessel (Type II PFD required, Type 1 PFD preferred as it will turn most unconscious wearers face up in water)</li> <li>• Appropriate, non-expired, visual distress devices for day and night use from the following: <ul style="list-style-type: none"> <li>- Three hand-held red flares (day and night) or;</li> <li>- One hand-held red flare and two parachute flares (day and night) or;</li> <li>- One hand-held orange smoke signal, two floating orange smoke signals (day) and one electric distress light (night only)</li> </ul> </li> <li>• Properly maintained and inspected USCG approved fire extinguishers (no fixed system = (2) B-1 or (1) B-2 type extinguishers, fixed system = (1) B-1 type extinguisher)</li> <li>• Proper ventilation of gasoline powered vessels</li> <li>• Sound producing device (whistle, bell, or horn)</li> <li>• VHF 2-way radio</li> <li>• Not exceed vessel safe loading capacity</li> <li>• Proper navigational light display</li> <li>• Throwable life ring with attached line (any vessel larger than 16 ft is required to carry one Type IV (throwable) PFD)</li> </ul>	
Additional USCG Recommended Equipment Includes:	
<ul style="list-style-type: none"> <li>• Extra visual distress signals</li> <li>• Spare Gravity</li> <li>• Heaving line</li> <li>• Fenders</li> <li>• First aid kit</li> <li>• Flashlight</li> <li>• Mirror</li> <li>• Searchlight</li> <li>• Sunburn lotion</li> <li>• Tool kit</li> <li>• Spare fuel</li> <li>• Chart and compass</li> </ul>	<ul style="list-style-type: none"> <li>• Boat hook</li> <li>• Spare propeller</li> <li>• Mooring line</li> <li>• Food and water</li> <li>• Binoculars</li> <li>• Spare batteries</li> <li>• Sunglasses</li> <li>• Marine hardware</li> <li>• Extra clothing</li> <li>• Spare parts</li> <li>• Alternate propulsion (oars/paddles)</li> <li>• Dewatering device (pump or bailer)</li> </ul>

Edit for clarity; what is spare gravity?

### 3.2.5 Working Over or Near Water

#### Personal Flotation Devices:

Personal flotation devices are not required where employees are continuously protected from the hazard of drowning by railings, nets, safety belts or other applicable provisions.

Type III, Type V, or better U.S. Coast Guard approved International Orange personal floatation device (PFD) shall be provided and properly worn by all personnel in the following circumstances:

1. On floating pipelines, pontoons, rafts, or stages;
2. On structures extending over or next to water except where guardrails or safety nets are provided for employees;
3. Working alone at night where there are drowning hazards, regardless of other safeguards provided;
4. In skiffs, small boats, or launches, unless in an enclosed cabin or cockpit; or
5. Whenever there is a drowning hazard.

The following precautions shall be followed when using personal floatation devices:

- Prior to and after each use, the buoyant work vests or life preservers shall be inspected for defects which would alter their strength or buoyancy. Defective devices or devices with less than 13 lbs. Buoyancy shall be removed from service.
- All PFDs shall be equipped with reflective tape as specified in 46 CFR 25.25-15.
- 30-inch U.S. Coast Guard approved ring buoys with at least 150 feet of 600 pound capacity line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.
- PFD lights conforming to 46 CFR 161.012 shall be required whenever there is potential need for life rings to be used after dark. On shore installations, at least one life ring, and every third one thereafter, shall have a PFD light attached. PFD lights on life rings are required only in locations where adequate general lighting (e.g., floodlights, light stanchions) is not provided.

#### Lifesaving and Safety Boats:

Regulations require that a lifesaving boat is available and ready for use under working conditions where there is a potential for employees to fall into swift running water, such as a river or a strait with strong currents. The following precautions shall be followed concerning the use of lifesaving powerboats:

- At least one lifesaving powerboat shall be immediately available at locations where employees work over or immediately next to water.
- Personnel trained in launching and operating the powerboat shall be readily available during working hours. Lifesaving personnel shall perform a lifesaving drill before the initiation of work at the project site and periodically thereafter (at least monthly or whenever new personnel are involved).
- Powerboats shall be kept afloat or ready for instant launching.
- Lifesaving powerboats shall be equipped, at a minimum, as follows:
  - Two oars (oars not required on boats powered by an inboard motor);
  - Oarlocks attached to the gunwales or the oars;
  - One ball-pointed boat hook;
  - One ring buoy with 50 feet of 600 pound capacity line attached; and
  - PFD's in number equaling the powerboat rating for the maximum number of personnel allowed on board.

- Powerboats shall have flotation tanks or buoyant material capable of floating the boat and its equipment and the crew.
- On vessels without permanently mounted navigational lights, portable battery-operated navigation lights will be available and used for night operations.

### **3.2.6 Hand and Power Tools**

Observe the following procedures and practices when working with hand and power tools:

- Keep hand tools sharp, clean, oiled, dressed, and not abused.
- Worn tools are dangerous: e.g., the “teeth” in a pipe wrench can slip if worn smooth; an adjustable wrench will slip if the jaws are sprung; hammerheads can fly off loose handles.
- Tools subject to impact (chisels, star drills, and caulking irons) tend to “mush-room.” Keep them dressed to avoid flying spalls. Use tool holders.
- Don't force tools beyond their capacity. No “homemade” handles or extensions (cheaters) are permitted! Don't use tools for pry bars.
- Flying objects can result from operating almost any power tool, so always warn people in the vicinity and use proper eye protection.
- Each power tool should be examined before use for damaged parts, loose fittings, and frayed or cut electric cords. Tag and return defective tools for repairs. Inspect also for adequate lighting, proper lubrication, and abandoned tools or material that could “vibrate into trouble.”
- Air must be shut off or the electric cord unplugged before making tool adjustments. Air must be “bled down” before replacement or disconnection.
- Proper guards or shields must be installed on all power tools before issue. Do not use improper tools or tools without guards in place.
- Replace all guards before start-up. Remove cranks, key, or wrenches used in ser-vice work.

### **3.2.7 Vehicular Traffic**

Observe the following procedures and practices regarding vehicular traffic:

- Wear traffic safety vest when vehicle hazard exists.
- Use cones, flags, barricades, and caution tape to define work area.
- Use vehicle to block work area.
- Engage police detail for high-traffic situations.
- Always use a spotter in tight or congested areas for material deliveries.

### **3.2.8 Noise**

Observe the following procedures and practices regarding noise:

- Wear hearing protection when equipment such as a drill rig, jackhammer, cut saw, air compressor, blower or other heavy equipment is operating on the site.
- Wear hearing protection whenever it is necessary to speak above normal conversational speech due to loud noise—this much noise indicates the need for protection.

- Conduct noise monitoring of suspected high noise operations at the beginning of the workday or start up of new operations to verify noise control/hearing protection requirements.

### **3.2.9 Lifting and Material Handling**

Observe the lifting and material handling procedures and practices:

- Use leather gloves when handling metal, wire rope, sharp debris, or transporting materials (wood, piping, drums, etc.).
- The size, shape, and weight of the object to be lifted must first be considered. No individual employee is permitted to lift any object that weights over 60 pounds. Multiple employees or mechanical lifting devices are required for objects over the 60-pound limit.
- Plan a lift before doing it. Bend at the knees and lift with the legs; keep the natural curves of the back; do not use back muscles.
- Check route for clearance.
- Use the buddy system when lifting heavy or awkward objects.
- Do not twist body while lifting.
- Know the capacity of any handling device (crane, forklift, chain fall, come-along) that you intend to use.
- Use tag lines to control loads.
- Ensure that your body, material, tools, and equipment are safe from such unexpected movement as falling, slipping, rolling, tripping, bowing, or any other un-controlled motion.
- Trucks (i.e., flat beds) hauling equipment or materials must not be moved once rigging has been released.
- Chock all material and equipment (such as pipe, drums, tanks, reels, trailers, and wagons) as necessary to prevent rolling.
- Tie down all light, large-surface-area material that might be moved by the wind.
- When working at heights, secure tools, equipment, and wrenches against falling.
- Do not store materials or tools on ducts, lighting fixtures, beam flanges, hung ceilings, or similar elevated locations.
- Fuel-powered tools used inside buildings or enclosures shall be vented and checked for excessive noise

### **3.2.10 Fire Control**

Observe the following fire control procedures and practices:

- Smoke only in designated areas.
- Keep flammable liquids in closed containers.
- Keep site clean; avoid accumulating combustible debris such as paper.
- Follow Hot Work Safety Procedures when welding or performing other activities requiring an open flame.
- Isolate flammable and combustible materials from ignition sources.

- Ensure fire safety integrity of equipment installations according to NEC specifications.

### **3.2.11 Static Electricity/Transfer of Flammable Liquids**

Observe the following procedures and practices regarding static electricity when transferring flammable liquids:

- Do not create static discharge in flammable atmosphere.
- Electrically bond and ground pumps, transfer vessels, tanks, drums, bailers, and probes when moving flammable liquids.
- Electrically bond and ground vacuum trucks and the tanks they are emptying.
- Do not splash fill containers with flammable liquids. **Add context to what activities this is associated with (ex: methane handling, others), and add to JHA.**
- Pour flammable liquids slowly and carefully.
- Two Fire extinguishers (2A20: BC) must be available, charged, inspected, and readily accessible.

### **3.2.12 Cleaning Equipment**

Observe the following procedures and practices when cleaning equipment:

- Wear appropriate PPE to avoid skin and eye contact with isopropyl alcohol, Alconox, or other cleaning materials.
- Stand upwind to minimize any potential inhalation exposure.
- Dispose of spent cleaning solutions and rinses accordingly.

## **3.3 Environmental Hazards and Controls**

### **3.3.1 Mosquitoes**

**not applicable to this site.  
Update to be site specific.**

Mosquitoes in the New Caledonia have been known to carry West Nile Virus, St. Louis encephalitis, and Dengue Fever. To avoid mosquito bites:

- Apply insect repellent containing DEET (N,N-diethyl-meta-toluamide) when you're outdoors.
- Read and follow the product directions whenever you use insect repellent.
- Wearing long-sleeved clothes and long pants treated with repellent to further reduce your risk, as will staying indoors during peak mosquito feeding hours (dusk until dawn).
- Limit the number of places available for mosquitoes to lay their eggs by eliminating standing water sources from around the work area.
- Check to see if there is an organized mosquito control program near the project site. If no program exists, work with your local government officials to establish a program.

### **3.3.2 Poisonous Snakes**

**There are no venomous snakes in the site's region. Remove this section**

Observe the following procedures and practices regarding poisonous snakes:

- Avoid walking in areas where snakes may nest or hide. When walking, always look ahead for signs of snakes.

- Use extreme caution when moving or lifting objects that could be used by snakes as cover.
- Never reach under or behind objects or into other areas where snakes may hide.
- Poisonous snakebites are medical emergencies—seek immediate medical treatment.
- Wear sturdy leather boots.

### **3.3.3 Bird Droppings**

Large populations of roosting birds may present a disease risk. The most serious health risks arise from disease organisms that grow in the accumulations of bird droppings, feathers, and debris under a roost – especially if roosts have been active for years. Among the fungal diseases associated with bird droppings, the two most common are Histoplasmosis and Cryptococcosis.

If you are working in an area where large quantities of droppings are present, follow certain precautions to minimize the risk from disease organisms in the droppings:

- Wear a respirator that can filter particles as small as 0.3 microns, such as a HEPA filter.
- Wear disposable protective gloves, hat, coveralls, and boots if you will be in close contact.
- Wash or shower at the work site after cleanup, if possible.
- Modify the structure or use methods to prevent birds from reestablishing the roost.

### **3.3.4 Feral Dogs**

Feral dogs have shown up on several Gravity jobsites. Packs of feral dogs can be dangerous, so if you observe them on the site, call animal control immediately. If a dog approaches you, take the following steps to reduce your chances of being attacked:

- Don't run away or run past the dog.
- Remain calm. Don't scream. If you say anything, speak calmly and firmly. Avoid eye contact. Try to stay still until the dog leaves, or back away slowly until the dog is out of sight. Don't turn and run.
- If you fall to the ground or are knocked down, curl into a ball, placing your hands over your head and neck. Protect your face.

If a dog bites someone, take the following steps:

- Restrain the dog immediately, if it is safe to do so. The dog will have to be quarantined or tested for rabies.
- Check on the victim's condition. Call 911 if paramedic response is required.
- Call the EHS Department to arrange for medical treatment.

### **3.3.5 Rodent-Borne Diseases**

Rodent infestation in the workplace has the potential to cause serious communicable diseases including hantavirus pulmonary syndrome and bubonic plague. The most common rodent-borne disease is hantavirus, which may infect workers who inhale tiny droplets containing the virus when fresh rodent urine, droppings or nesting materials are stirred up.

Working conditions that may put workers at risk of hantavirus include:

- Contact with rodent feces or dried urine which may mobilize particles of these wastes into the air where they may be inhaled
- Entry into rooms or warehouses that have been closed up and infested for extended periods
- Activities that stir up dust which may mobilize hantavirus

If working in areas of obvious rodent infestation, take the following precautions:

- Do not enter rooms or warehouses that have been closed up unless absolutely necessary.
- If work in closed up areas or areas with rodent infestation is necessary, contact professional exterminators to eliminate the infestation and clean up the location
- If an exterminator is not available/possible, employees should clean up the infested area using the following steps
  - When going into outbuildings or rooms that have been closed for an extended period, open them up and air out before cleaning
  - Don an air purifying respirator equipped with HEPA P-100 cartridges and nitrile gloves before cleaning
  - Don't stir up dust by sweeping up or vacuuming up droppings, urine or nesting materials
  - Thoroughly wet contaminated areas with detergent or liquid to deactivate the virus. Most general-purpose disinfectants and household detergents are effective. However, a hypochlorite solution prepared by mixing 1 and 1/2 cups of household bleach in 1 gallon of water may be used in place of commercial disinfectant.
  - Once everything is wet, take up contaminated materials with a damp towel, then mop or sponge the area with disinfectant.
  - Spray dead rodents with disinfectant and flea repellent (to avoid bubonic plague), then double-bag and dispose in appropriate waste disposal system. Contact the local or state health department for other disposal methods.
  - Finally, remove respirator and disinfect gloves before taking them off with disinfectant or soap and water. After taking off the clean gloves, thoroughly wash hands with soap and warm water.

If you experience hantavirus symptoms (fatigue, fever, and muscle aches) within 1 to 5 weeks of exposure to potentially affected rodents and their droppings, contact your supervisor immediately.

### **3.3.6 Heat Stress**

Observe the following general procedures and practices regarding heat stress:

- Increase number of rest breaks and/or rotate workers in shorter work shifts.
- Watch for signs and symptoms of heat exhaustion and fatigue.
- During hot months, plan work for early morning or evening.
- Use ice vests when necessary.
- Rest in cool, dry areas.



### 3.3.6.1 Signs, Symptoms, and Treatment

Adverse climatic conditions are important considerations in planning and conducting site operations. High ambient temperature can result in health effects ranging from transient heat fatigue, physical discomfort, reduced efficiency, personal illness, increased accident probability, etc., to serious illness or death. Heat stress is of particular concern when chemical protective garments are worn since they prevent evaporative body cooling. Wearing personal protective equipment places employees at considerable risk of developing heat stress.

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses, regular monitoring and other preventive precautions are vital.

**Heat Rash.** Heat rash can be caused by continuous exposure to hot and humid air and skin abrasion from sweat soaked clothing. The condition is characterized by a localized red skin rash and reduced sweating. Aside from being a nuisance, the ability to tolerate heat is reduced. To treat, Keep skin hygienically clean and allow it to dry thoroughly after using chemical protective clothing.

**Heat Cramps.** Heat cramps are caused by profuse perspiration with inadequate electrolytic fluid replacement. This often robs the larger muscle groups (stomach and quadriceps) of blood which can cause painful muscle spasms and pain in the extremities and abdomen. To treat, remove employee to a cool place and give sips of water or an electrolytic drink. Watch for signs of heat exhaustion or stroke.

**Heat Exhaustion.** Heat exhaustion is a mild form of shock caused by increased stress on various organs to meet increased demand to cool the body. Onset is gradual and symptoms should subside within one hour. It symptoms include weak pulse; shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; fatigue. To treat, remove employee to a cool place and remove as much clothing as possible. Give sips of water or electrolytic solution and fan the person continuously to remove heat by convection. Do not allow the affected per-son to become chilled—treat for shock if necessary.

**Heat Stroke.** Heat stroke is the most severe form of heat stress; the body must be cooled immediately to prevent severe injury and/or death. *This is a medical emergency!* Symptoms include red, hot, dry skin; body temperature of 105° Fahrenheit or higher; no perspiration; nausea; dizziness and confusion; strong, rapid pulse. Since heat stroke is a true medical emergency, transport the victim to a medical facility immediately. Prior to transport, remove as much clothing as possible and wrap the victim in a sheet soaked with water. Fan vigorously while transporting to help reduce body temperature. Apply cold packs, if available; place under the arms, around the neck, or any other place where they can cool large surface blood vessels. If transportation to a medical facility is delayed, reduce body temperature by immersing victim in a cool water bath (however, be careful not to over-chill the victim once body temperature is reduced below 102o F). If this is not possible, keep victim wrapped in a sheet and continuously douse with water and fan.

### 3.3.6.2 Prevention

The implementation of preventative measures is the most effective way to limit the effects of heat-related illnesses. During periods of high heat, adequate liquids must be provided to re-place lost body fluids. Replacement fluids can be a 0.1 percent salt-water solution, a commercial mix such as Gatorade, or a combination of these with fresh water. The replacement fluid temperature should be kept cool, 50o F to 60o F, and should be placed close to the work area. Employees must be encouraged to drink more than the amount required to satisfy thirst. Employees should also be encouraged to salt their foods more heavily during hot times of the year.

Cooling devices such as vortex tubes or cooling vests can be worn beneath impermeable clothing. If cooling devices are worn, only physiological monitoring will be used to determine work activity.

All workers are to rest when any symptoms of heat stress are noticed. Rest breaks are to be taken in a cool, shaded rest area. Employees shall remove chemical protective garments during rest periods and will not be assigned other tasks.

All employees shall be informed of the importance of adequate rest and proper diet including the harmful effects of excessive alcohol and caffeine consumption.

### **3.3.6.3 Monitoring**

Heat stress monitoring will be required when employees are working in environments exceeding 90°F ambient air temperature. If employees are wearing impermeable clothing, this monitoring will begin at 78°F. There are two general types of monitoring that the health and safety representative can designate to be used: wet bulb globe temperature (WBGT) and physiological. The Heat Stress Monitoring Record form (see Appendix B) will be used to record the results of heat stress monitoring.

**Wet Bulb Globe Temperature (WBGT).** The WBGT index is the simplest and most suitable technique to measure the environmental factors which most nearly correlate with core body temperature and other physiological responses to heat. When WBGT exceeds 25.9°C (78°F), the work regimen in Table 1 and Figure 1 of the section Heat Stress in the latest edition of the “American Conference of Governmental Industrial Hygiene (ACGIH) Threshold Limit Value (TLV) Booklet” should be followed.

**Physiological.** Physiological monitoring can be used in lieu of, or in addition to, WBGT. This monitoring can be self-performed once the health and safety representative demonstrates appropriate techniques to affected employees. Since individuals vary in their susceptibility to heat, this type of monitoring has its advantages. The two parameters that are to be monitored at the beginning of each rest period are:

- **Heart Rate** – The maximum heart rate (MHR) is the amount of work (beats) per minute a healthy person’s heart can be expected to safely deliver. Each individual will count his/her radial (wrist) pulse as early as possible during each rest period. If the heart rate of any individual exceeds 75 percent of their calculated maximum heart rate ( $MHR = 200 - \text{age}$ ) at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. An individual is not permitted to return to work until his/her sustained heart rate is below 75 percent of their calculated maximum heart rate.
- **Temperature** – Each individual will measure his/her temperature with a thermometer for one minute as early as possible in the first rest period. If the temperature exceeds 99.6°F at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. An individual is not permitted to return to work if his/her temperature exceeds 100.4°F

### **3.3.6.4 Training**

Employees potentially exposed to heat stress conditions will be instructed on the contents of this procedure. This training can be conducted during daily tailgate safety meetings.

### **3.3.7 Cold Stress**

Observe the following procedures and practices regarding cold stress:

- Take breaks in heated shelters when working in extremely cold temperatures.
- Upon entering the shelter, remove the outer layer of clothing and loosen other layers to promote evaporation of perspiration.

- Drink warm liquids to reduce the susceptibility to cold stress.
- Be aware of cold stress symptoms, including shivering, numbness in the extremities, and sluggishness.
- Provide adequate insulating dry clothing to maintain warmth if work is performed in air temperature below 40° F. Wind chill cooling rates and the cooling power of air are critical factors. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required.
- If the air temperature is of 32° F or less, hands should be protected.
- If only light work is involved and if the clothing on the worker may become wet on the job site, the outer layer of the clothing in use should be impermeable to water. With more severe work under such conditions, the outer layer should be water repellent, and the outer wear should be changed as it becomes wetted. The outer garments should include provisions for easy ventilation in order to prevent wetting of inner layer by sweat.
- If available clothing does not give adequate protection to prevent cold injury, work should be modified or suspended until adequate clothing is made available, or until weather conditions improve.
- Implementing a buddy system in which workers are responsible for observing fellow workers for early signs and symptoms of cold stress.

### ***3.3.7.1 Signs, Symptoms, and Treatment***

Cold stress can range from frostbite to hypothermia. Below are listed the signs and symptoms of cold stress. Personnel should follow the appropriate guidelines if any personnel exhibit these symptoms:

**Frostbite** - Pain in the extremities and loss of manual dexterity. "Frostnip" or reddening of the tissue, accompanied by a tingling or loss of sensation in the extremities. Continuous shivering.

**Hypothermia** -Pain in the extremities and loss of manual dexterity. Severe, uncontrollable shivering. Inability to maintain level of activity. Excessive fatigue, drowsiness, irritability, or euphoria. Severe hypothermia: clouded consciousness, low blood pressure, pupil dilation, cease of shivering, unconsciousness, and possible death.

Remove the patient to a warm, dry place. If clothing is wet, remove and replace with dry clothing. Keep patient warm. Re-warming of patient should be gradual to avoid stroke symptoms. Dehydration of the loss of body fluids may result in cold injury due to a significant change in blood flow to the extremities. If patient is conscious and alert, warm sweet liquids should be provided. Coffee and other caffeinated liquids should be avoided because of diuretic and circulatory effects. Extremities affected by frostbite should be gradually warmed up and returned to normal temperature. Moist compresses should be applied; begin with lukewarm compresses and slowly increase the temperature as changes in skin temperature are detected. Keep patient warm and calm, remove to a medical facility as soon as possible.

### ***3.3.8 Inclement Weather***

Observe the following procedures and practices regarding inclement weather:

- Stop outdoor work during electrical storms, hailstorms, and other extreme weather conditions such as extreme heat or cold.
- Take cover indoors or in vehicle.

- Listen to local forecasts for warning about specific weather hazards such as tornadoes, hurricanes, and flash floods.

## 4.0 Personal Protective Equipment

The minimum level of PPE should be selected according to the hazards that may be encountered during site activities in accordance with established U.S. EPA levels of protection (D and C). Only PPE that meets the following American National Standards Institute (ANSI) standards are to be worn:

- Eye protection - ANSI Z87.1-1989.
- Head protection - ANSI Z89.1-1986.
- Foot protection - ANSI Z41-1991.
- Traffic vest in high traffic areas and around heavy equipment.

### 4.1.1 Level D

Level D protection will be used when:

- The atmosphere contains no known hazard
- Work functions preclude splashes, immersions, or the potential for unexpected inhalation of, or contact with, hazardous concentrations of chemicals
- Atmospheric concentrations of contaminants are less than the Threshold Limit Value (TLV)

## 4.2 Activity Specific Levels of Protection

See Tables 4-2 and 4-3 for general PPE requirements for Levels D and C protection for project work sites.

Level D is the minimum acceptable level for sites where petroleum hydrocarbons are the COC. Upgrade to Modified Level D occurs when there is a possibility that contaminated media can contact the skin or work uniform. Upgrade to Level C occurs when the results of air monitoring reveals that action levels have been exceeded. Wear hearing protection when there are high noise levels. Workers must maintain proficiency in the use and care of PPE that is to be worn.

**Table 4-4**  
**Activity Specific PPE/Air Monitoring Summary**

Job Task	PPE Level	Instrument	Monitoring Frequency / Special Requirements
Loading and unloading sample coolers, boat equipment, general non-sampling activities on boat	Level D	N/A	Hard hat for overhead hazards. PFD when working on or near water.
Operation of sampling vessel and equipment from inside boat house (MSS operator)	Modified Level D	N/A	Should not leave pilot house if overhead hazards, decontamination chemicals, or sediment exposure is possible. PFD when working on or near water.
Decontamination of sampling equipment	Level D with potential upgrade to Level C	PID	Potential upgrade to Level C when handling samples – presence of product odors. Air monitoring at start up of work at each

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			task location, then every 30 – 60 minutes based upon air monitoring results. Monitor 15 minutes to continuously if action levels have been reached. Face shield with hard hat for splash hazard and overhead hazard. PFD when working on or near water.
General site duties, system O&M, operation of equipment, etc.	Level D	N/A	Hard hat for overhead hazards. PFD when working on or near water.

*Note 1: "Start up of work at each new task location" means to monitor the air quality at each new operation on the site. The breathing zone is the area inside a 1-foot radius around the head.*

*Note 2: A downgrade in the air monitoring program must be approved by the SHSO and HSM.*

## **5.0 Decontamination**

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### **5.1 Decontamination Procedures**

Operations conducted at this site have the potential to contaminate field equipment and PPE. See the following sections for the decontamination procedures that must be followed to prevent the transfer of contamination to vehicles, administrative offices, and personnel.

#### **5.1.1 Field Equipment**

Field equipment can include bailers, interface probes, hand tools, drill augers, and miscellaneous sampling equipment. Observe the following practices and procedures when decontaminating field equipment:

- Decontaminate with a solution of detergent and water; rinse with water prior to leaving the site.
- Protect from exposure by covering with disposable covers such as plastic to minimize required decontamination activities.

#### **5.1.2 Disposable PPE**

Disposable PPE can include Tyvek suits, inner latex gloves, respirator cartridges. Observe the following practices and procedures when decontaminating disposable PPE:

- Dispose of according to the requirements of the client and state and federal agencies.
- Change out respirator cartridges daily and dispose accordingly.

#### **5.1.3 Non-disposable PPE**

Non-disposable PPE can include respirators and boots and gloves. When decontaminating respirators, observe the following practices and procedures:

- Wipe out respirator with disinfecting pad prior to donning.
- Decontaminate on site at the close of each day with a solution of an approved sanitizing solution.

When decontaminating boots and gloves, observe the following practices and procedures:

- Decontaminate outside with a solution of detergent and water; rinse with water prior to leaving the site.
- Protect from exposure by covering with disposable covers such as plastic to minimize required decontamination activities.

#### **5.1.4 Emergency Decontamination**

Personnel with medical problems or injuries may also require decontamination. There is the possibility that the decontamination may aggravate or cause more serious health effects. If prompt lifesaving, first aid, and medical treatment are required, decontamination procedures will be omitted. In either case, a member of the site management team will accompany contaminated personnel to the medical facility to advise on matters involving decontamination.

#### **5.1.5 Sanitizing of Personal Protective Equipment**

Respirators, reusable protective clothing, and other personal articles not only must be decontaminated before being reused, but also sanitized. The insides of masks and clothing become soiled due to

exhalation, body oils, and perspiration. Manufacturer's instructions should be used to sanitize the respirator masks. If practical, reusable protective clothing should be machine-washed after a thorough decontamination; otherwise, it must be cleaned by hand.

## **6.0 Site Control/Communications**

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### **6.1 Site Control**

To prevent contamination from migrating from personnel and equipment, work areas will be clearly specified as an Exclusion Zone (EZ), Contaminant Reduction Zone (CRZ), or Support Zone (SZ) prior to beginning operations. Each work area will be clearly identified using signs or physical barriers.

The primary purpose for site controls is to establish the hazardous area perimeter, to reduce migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by personnel. At the end of each workday, the site should be secured and/or guarded to prevent unauthorized entry. Site work zones will include:

- **Clean Zone/Support Zone (SZ).** This uncontaminated zone will be the area outside the exclusion and decontamination (decon) zone and within the geographic perimeters of the site (boat and processing area). This area is used for staging of materials, parking of vehicles, office and laboratory facilities, sanitation facilities, and receipt of deliveries. Personnel entering this zone may include delivery personnel, visitors, security guards, etc., who will not necessarily be permitted in the exclusion zone.
- **Contaminant Reduction Zone (CRZ).** The contaminant reduction zone will provide a location for removal of contaminated PPE and final decontamination of PPE. A separate decontamination area will be established for heavy equipment. All personnel and equipment must exit via the decon area.
- **Exclusion Zone/Hot Zone (EZ).** The exclusion zone will be the “hot zone” or contaminated area inside the site perimeter (sample collection area of boat). Entry to and exit from this zone will be made through a designated point. Appropriate warning signs to identify the exclusion zone should be posted (i.e., DANGER, AUTHORIZED PERSONNEL ONLY, PROTECTIVE EQUIPMENT BEYOND THIS POINT, etc.). Personnel and equipment decontamination must accompany exit from the exclusion zone.

For sediment investigations, the exclusion zone is defined as the area where individuals may come in direct contact with potentially contaminated sediment (i.e. sampling equipment, decontamination area and chemicals, bow of sampling vessel). For core extrusion activities, the exclusion zone will be defined as the area where extrusion activities occur.

A log of all personnel visiting, entering, or working on the site shall be maintained by the SS or SHSO. No visitor will be allowed in the EZ without showing proof of training and medical certification, per 29 CFR 1910.120(e), (f). Visitors will attend a site orientation given by the SS/SHSO and sign the HASP.

#### **6.1.1 General Site Control Safety Procedures**

The following are standard safe work practices that apply to all site personnel; they will be discussed in the safety briefing prior to initiating work on the site:

- Eating, drinking, chewing gum or tobacco, and smoking is prohibited in the EZ/CRZs.
- Hands and face must be washed upon leaving the EZ and before eating, drinking, chewing gum or tobacco, and smoking.
- A buddy system will be used. Hand signals will be established to maintain communication.



- During site operations, each worker will consider himself as a safety backup to his partner. Off-site personnel will provide emergency assistance.
- Visual contact will be maintained between buddies on-site when performing hazardous duties.
- No personnel will be admitted to the site without the proper safety equipment, training, and medical surveillance certification.
- All personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the SS/SSO, will be immediately dismissed from the site.
- Proper decontamination procedures must be followed before leaving the EZ.

### **6.1.2 Site Security and Work Zone Definition**

This Section contains general guidelines for developing site security measures for working in a street or roadway and excavations.

#### **6.1.2.1 Working In Street or Roadway**

Observe the following site control practices and procedures when working in streets or road-ways:

- Wear traffic vest and hardhat when vehicle hazard exists.
- Use cones, flag-mounted cones, caution tape, and/or barricades.
- Use vehicle strobe light and block area with truck.
- Develop traffic flow plan for high traffic situations (as appropriate):
  - use flag person
  - use flashing arrow sign
  - use “MEN WORKING” signs liberally
  - obtain lane closing permits
  - engage police details

Remove, or clarify what activities require road work. If applicable, add to JHA.

### **6.2 Field Communications**

Communications between all Shaw employees and subcontractors at the work site can be verbal and/or non-verbal. Verbal communication can be affected by the on-site background noise and various PPE. See Table 6-1 for a list of the type of communication methods and equipment to use, depending on site conditions. Communication equipment must be checked daily to ensure proper operation. All project personnel must be initially briefed on the communication methods prior to starting work; communication methods should be reviewed in Daily Tailgate Safety Meetings.

**Table 6-1**  
**Field Communication Methods**

Communication Device	Type of Communications	Signal
Telephone On-Site Or Cellular Telephone	Emergency notification	Initiate phone call using applicable emergency numbers
Two-way Radio	Emergency notification among site personnel	Initiate radio communication with Code Red message
Compressed Air Horn	Hailing site personnel for non-emergency	One long blast, one short blast
Compressed Air Horn	Hailing site personnel for emergency evacuation	Three long continuous blasts
Visual	Hailing site personnel for distress, need help	Arms waved in circle overhead
Visual	Hailing site personnel for emergency evacuation	Arms waved in criss-cross over head
Visual	Contaminated air/strong odor	Hands clutching throat
Visual	Break, lunch, end of day	Two hands together, break apart

## ***7.0 Emergency Response and Contingency Plan***

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In the event of an emergency, immediate action must be taken by the first person to recognize the event.

### ***7.1 Spills and Releases of Hazardous Materials***

When required, notify the National Response Center. The following information should be provided to the National Response Center:

- Name and telephone number.
- Name and address of facility.
- Time and type of incident.
- Name and quantity of materials involved, if known.
- Extent of injuries.
- Possible hazards to human health or the environment outside of the facility.

Include discussion and requirements for spill response kits specific to hazardous materials at the site, including fuel, methanol, hexane, and any other hazardous material/waste to be on site.

The emergency telephone number for the National Response Center is 800-424-8802. If hazardous waste has been released or produced through control of the incident, ensure that:

- Waste is collected and contained.
- Containers of waste are removed or isolated from the immediate site of the emergency.
- Treatment or storage of the recovered waste, contaminated soil or surface water, or any other material that results from the incident or its control is provided.
- Ensure that no waste that is incompatible with released material is treated or stored in the facility until cleanup procedures are completed.
- Ensure that all emergency equipment used is decontaminated, recharged, and fit for its intended use before operations are resumed.

### ***7.2 Emergency First Aid Procedures***

- Maintain a first aid kit and eye wash station on site.
- Survey the situation. Do not endanger your own life. Do not enter a confined space to rescue someone who has been overcome unless properly equipped and trained. Ensure all protocols are followed including that a standby person is pre-sent. If applicable, review MSDS to evaluate response actions for chemical exposures.
- Call 911 (if available) or the fire department immediately. Explain the physical injury, chemical exposure, fire, or release.
- Decontaminate the victim without delaying life-saving procedures.
- If the victim's condition appears to be non-critical, but seems to be more severe than minor cuts, he/she should be transported to the nearest hospital by trained Emergency Medical Services (EMS) personnel: let the doctor assume the responsibility for determining the severity of the injury. If the condition is obviously serious, EMS must transport the victim.
- Notify the PM, SS and the SHSO. Complete the appropriate incident investigation reports.

#### ***7.2.1 Stop Bleeding and CPR Guidelines***

**To Stop Bleeding**

Perform the following steps to stop bleeding. Responder must have a current certificate to administer first aid.

1. Give medical statement.
2. Assure airway, breathing, and circulation.
3. Use direct pressure over the wound with clean dressing or your hand (use non-permeable gloves). Direct pressure will control most bleeding.
4. Bleeding from an artery or several injury sites may require direct pressure on a pressure point. Use pressure points for 30 to 60 seconds to help control severe bleeding.
5. Continue primary care and seek medical aid as needed.

### **CPR**

Perform the following steps to administer CPR. Responder must have a current certificate to administer CPR.

1. Make sure the scene is safe before administering aid to the victim.
2. Arousal: Check for consciousness. If not conscious continue with these CPR instructions.
3. Open airway with chin-lift.
4. Look, listen, and feel for breathing.
5. If breathing is absent, give 2 breaths (1 second each) with visible chest rise. NOTE: Use a CPR mask or other approved barrier device if possible.
6. Bare victim's chest and locate CPR finger position.
7. Deliver first cycle of 30 chest compressions at a rate of not less than one per second.
8. Repeat Steps 5, 6 and 7 until an AED has arrived and is ready to deliver a shock, or you have been relieved by another CPR-trained person or professional emergency response personnel.

### ***7.2.2 Injury Management/Incident Notification***

Observe the following injury management/incident notification procedures and practices:

#### **Injury Management**

Observe the following injury management procedures and practices:

- Once a personal injury incident is discovered the first action will be to ensure the injured party received appropriate medical attention.
- If it is safe to do so, the nearest workers will immediately assist a person who shows signs of medical distress or who is involved in an accident.
- The work crew supervisor will be summoned. The work crew supervisor will immediately make contact with the PM or other designated individual to alert them of the medical emergency. The work crew supervisor will advise and perform the following "Care of the Employee":
  - Location of the victim at the work site.

- Nature of the emergency.
- Whether the victim is conscious.
- Specific conditions contributing to the injury, if known.
- Escort the injured person to the occupational clinic or hospital or arrange for ambulance.

### Notification Requirements

Directly After “Care of the Employee,” make the following notifications, in order:

- Contact the PM and H&S Manager immediately
- PM will contact upper line management
- The H&S Manager will facilitate the incident investigation

All client requirements will also be adhered to pertinent to personal injury incident reporting.

### Incident Other Than Personal Injury

All incidents including fire, explosion, property damage, environmental release etc. will be responded in accordance with the AECOM site specific Health and Safety Plan. In general, this includes securing the site appropriate to the incident, turning control over to the emergency responders, or securing the site and summoning appropriate remedial personnel or equipment. Gravity will immediately notify the client of any major incident, fire, equipment/ property damage, and environmental incident with a preliminary report. A full report will be provided within 72 hours.

## 7.3 Site Emergency Information

**Table 7-1**  
**Site Emergency Form / Emergency Phone Numbers\***

Is this supposed to be Fred Devine  
**Diving** and Salvage at 6211 N  
Ensign St, Portland, OR 97217?  
Please include address.

Category	Information
Possible Contaminants of Concern	Heavy Metals, organics
Minimum Level of Protection	Level D
Site(s) Location Address	Fred Devine and Salvage
Emergency Phone Numbers	
Contact	Project Manager 425-281-1471
Ambulance	15
Fire	15
Police	16
Poison Control	1-800-222-1212
Project Manager (PM)	Shawn Hinz
Site Supervisor (SS)	Chad Furulie
Site Health and Safety Officer (SHSO)	Jeff Wilson
Project Health and Safety Manager (PHSM)	Jeff Wilson

National Response Center

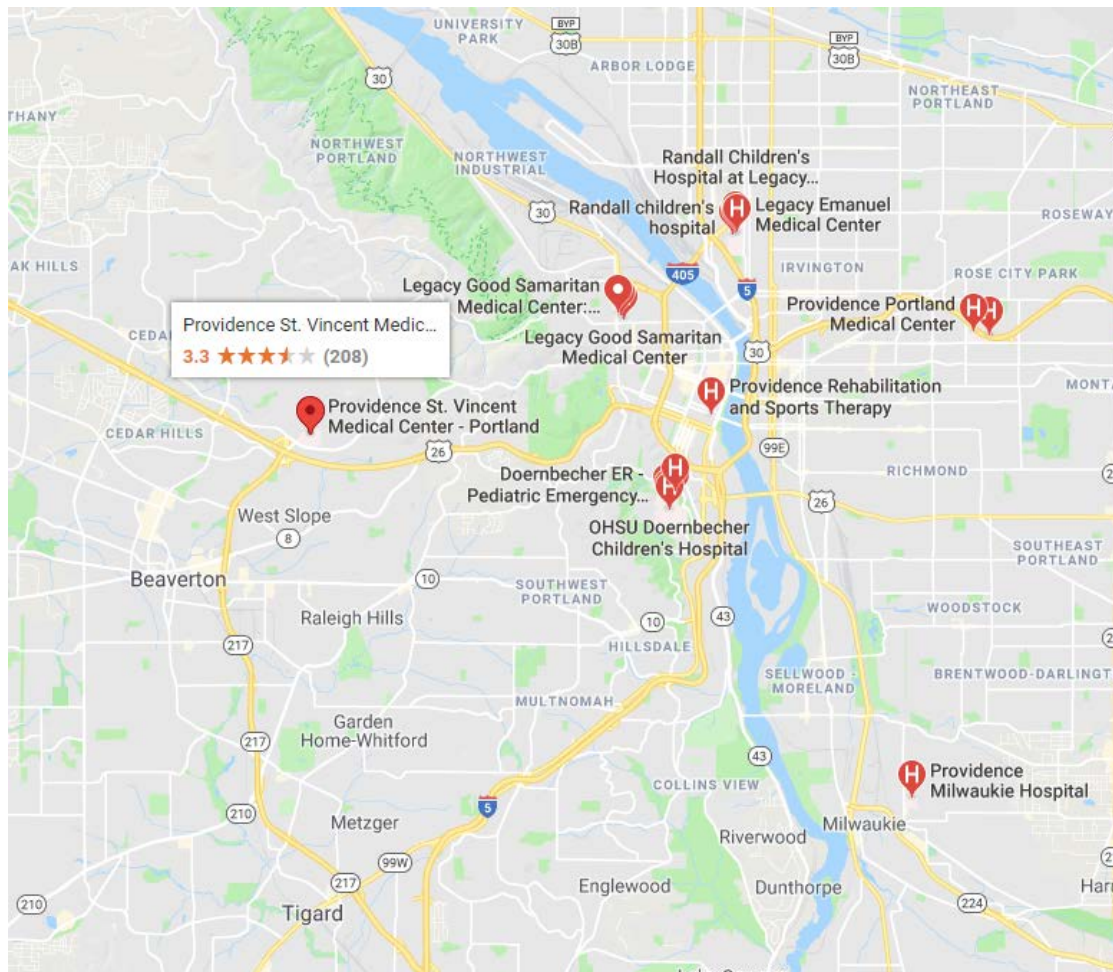
1-800-424-8802

*\*In the event of any emergency contact the Project Manager (PM) or the Health and Safety Representatives (SHSO or Project CIH)*

**Table 7-2**

**Hospital Information: TBD**

Category	Information
Name:	Providence St. Vincent Medical Center
Address:	9205 SW Barnes Rd,
City, State:	Portland, OR 97225
Phone:	(503) 216-1234
Emergency Phone:	



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## **APPENDICES**

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***Appendix A***  
***Safety Plan Acknowledgement Form***



## Safety Plan Acknowledgement Form

**Project #: 081236**

**Project Name:**

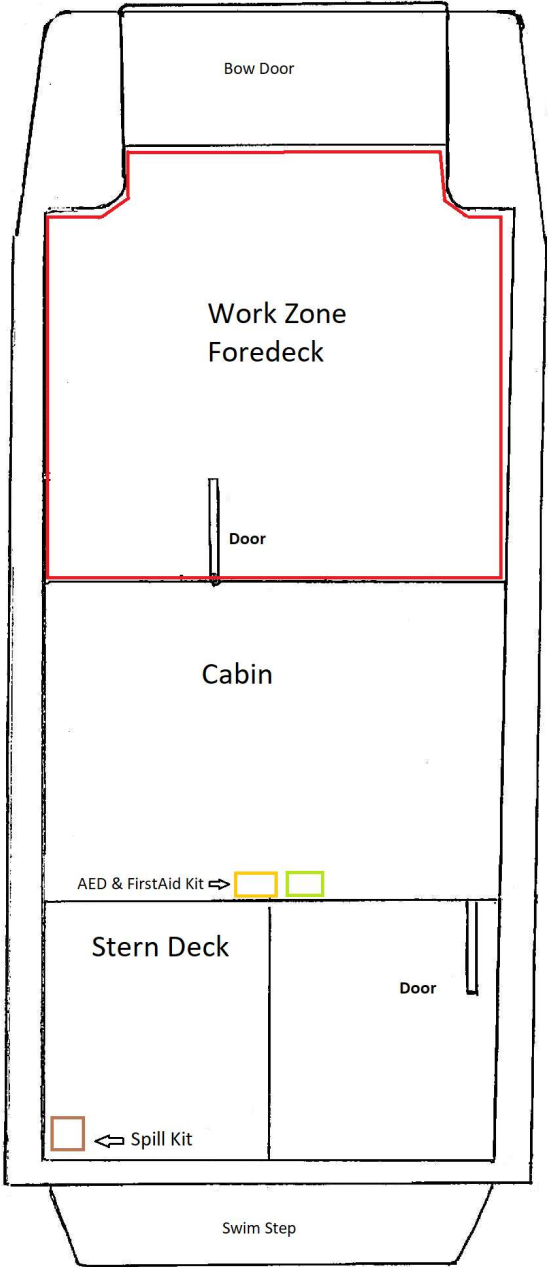
I have read the site-safety plan for this site and fully understand its contents.

[illegible]

***Appendix  
B  
Offshore Medical Certifications***

Attachment 3. Vessel Diagrams

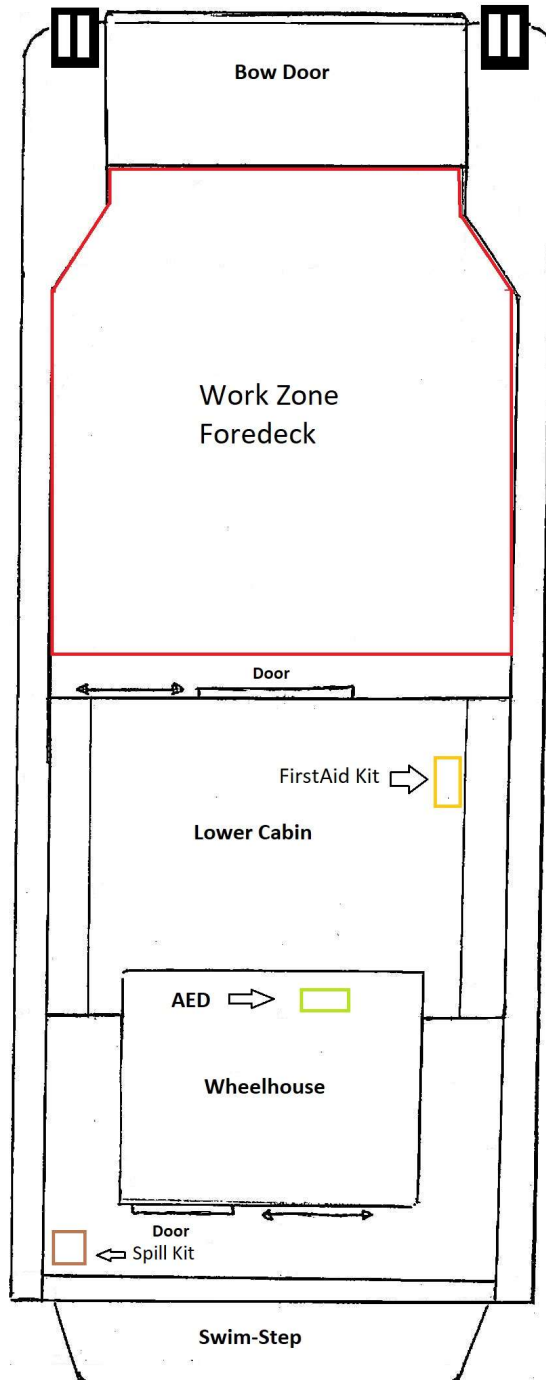
RV Cayuse  
Gravity Marine



Designate exclusion zone and  
contamination reduction zone



**RV - Tieton**  
Gravity Marine



Designate support zone, exclusion zone  
and contamination reduction zone

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**Methanol, Lab Grade, 4L****SECTION 1 : Identification of the substance/mixture and of the supplier****Product name :** Methanol, Lab Grade, 4L**Manufacturer/Supplier Trade name:****Manufacturer/Supplier Article number:** S25426A**Recommended uses of the product and uses restrictions on use:****Manufacturer Details:**AquaPhoenix Scientific  
9 Barnhart Drive, Hanover, PA 17331**Supplier Details:**Fisher Science Education  
15 Jet View Drive, Rochester, NY 14624**Emergency telephone number:**

Fisher Science Education Emergency Telephone No.: 800-535-5053

**SECTION 2 : Hazards identification****Classification of the substance or mixture:****Flammable**

Flammable liquids, category 2

**Toxic**

Acute toxicity (oral, dermal, inhalation), category 3

**Health hazard**

Specific target organ toxicity following single exposure, category 1

AcTox Dermal. 3

Flammable liq. 2

AcTox Oral. 3

AcTox Inhaln. 3

Stot SE. 1

**Signal word :** Danger**Hazard statements:**

Highly flammable liquid and vapour

Toxic if swallowed

Toxic in contact with skin

Toxic if inhaled

Causes damage to organs

**Precautionary statements:**

If medical advice is needed, have product container or label at hand

Keep out of reach of children

Read label before use

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### Methanol, Lab Grade, 4L

Wear protective gloves/protective clothing/eye protection/face protection  
Wash skin thoroughly after handling  
Do not eat, drink or smoke when using this product  
Avoid breathing dust/fume/gas/mist/vapours/spray  
Keep away from heat/sparks/open flames/hot surfaces. No smoking  
Do not breathe dust/fume/gas/mist/vapours/spray  
Specific treatment (see supplemental first aid instructions on this label)  
IF ON SKIN: Wash with soap and water  
Call a POISON CENTER or doctor/physician if you feel unwell  
Specific measures (see supplemental first aid instructions on this label)  
Take off contaminated clothing and wash before reuse  
Wash contaminated clothing before reuse  
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician  
IF exposed: Call a POISON CENTER or doctor/physician  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
Store locked up  
Store in a well ventilated place. Keep cool  
Dispose of contents and container as instructed in Section 13

#### Other Non-GHS Classification:

##### WHMIS



##### NFPA/HMIS



NFPA SCALE (0-4)

Health	2
Flammability	3
Physical Hazard	0
Personal Protection	X

HMIS RATINGS (0-4)

### SECTION 3 : Composition/Information on Ingredients

#### Ingredients:

CAS 67-56-1

Methanol

>90 %

**Methanol, Lab Grade, 4L**

Percentages are by weight

**SECTION 4 : First aid measures**

**Description of first aid measures**

**After inhalation:** Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position. Get medical assistance. If breathing is difficult, give oxygen.

**After skin contact:** Wash affected area with soap and water. Rinse/flush exposed skin gently using water for 15-20 minutes. Seek medical attention if irritation persists or if concerned.

**After eye contact:** Protect unexposed eye. Rinse or flush eye gently with water for at least 15-20 minutes, lifting upper and lower lids. Seek medical attention if irritation persists or if concerned.

**After swallowing:** Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Dilute mouth with water or milk after rinsing. Get medical assistance.

**Most important symptoms and effects, both acute and delayed:**

Poison. Toxic by ingestion, absorption through skin and inhalation, potentially causing irreversible effects. Irritating to eyes, skin, and respiratory tract. Irritation- all routes of exposure. Shortness of breath. Nausea. Headache. May be fatal or cause blindness if swallowed. Cannot be made non-poisonous. May cause gastrointestinal irritation, vomiting, and diarrhea. Central nervous system disorders. Skin disorders, preexisting eye disorders, gastrointestinal tract; Toxic: danger of very serious irreversible effects by inhalation, ingestion or absorption through skin. Experiments have shown reproductive toxicity effects on laboratory animals. May cause adverse kidney and liver effects.

**Indication of any immediate medical attention and special treatment needed:**

If seeking medical attention, provide SDS document to physician. Physician should treat symptomatically.

**SECTION 5 : Firefighting measures**

**Extinguishing media**

**Suitable extinguishing agents:** Dry chemical, foam, dry sand, or Carbon Dioxide. Water spray can keep containers cool.

**For safety reasons unsuitable extinguishing agents:** Water may be ineffective.

**Special hazards arising from the substance or mixture:**

Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated.

**Advice for firefighters:**

**Protective equipment:** Wear protective eyewear, gloves, and clothing. Refer to Section 8.

**Additional information (precautions):** Remove all sources of ignition. Avoid contact with skin, eyes, and clothing. Ensure adequate ventilation. Take precautions against static discharge.

**SECTION 6 : Accidental release measures**

**Personal precautions, protective equipment and emergency procedures:**

Use spark-proof tools and explosion-proof equipment. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. Ensure adequate ventilation.

**Environmental precautions:**

Prevent from reaching drains, sewer or waterway. Should not be released into environment.

**Methods and material for containment and cleaning up:**

If necessary use trained response staff or contractor. Remove all sources of ignition. Contain spillage and then

**Methanol, Lab Grade, 4L**

collect. Do not flush to sewer. Absorb with a noncombustible absorbent material such as sand or earth and containerize for disposal. Ventilate area of leak or spill. Use spark-proof tools and explosion-proof equipment. Follow proper disposal methods. Refer to Section 13.

**Reference to other sections:**

**SECTION 7 : Handling and storage**

**Precautions for safe handling:**

Use in a chemical fume hood. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes, and clothing. Take precautions against static discharge.

**Conditions for safe storage, including any incompatibilities:**

Store in a cool location. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame. Keep container tightly sealed. Store with like hazards. Protect from freezing and physical damage.

**SECTION 8 : Exposure controls/personal protection**



**Control Parameters:**

67-56-1, Methanol, ACGIH: 250 ppm STEL; 200 ppm TWA  
67-56-1, Methanol, NIOSH: 250 ppm STEL; 325 mg/m<sup>3</sup> STEL  
67-56-1, Methanol, NIOSH: 200 ppm TWA; 260 mg/m<sup>3</sup> TWA

**Appropriate Engineering controls:**

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling. Ensure that dust-handling systems (exhaust ducts, dust collectors, vessels, and processing equipment) are designed to prevent the escape of dust into the work area.

**Respiratory protection:**

Use in a chemical fume hood. If exposure limit is exceeded, a full-face respirator with organic cartridge may be worn.

**Protection of skin:**

Select glove material impermeable and resistant to the substance. Select glove material based on rates of diffusion and degradation.

**Eye protection:**

Safety glasses with side shields or goggles.

**General hygienic measures:**

Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Perform routine housekeeping.

**SECTION 9 : Physical and chemical properties**

<b>Appearance (physical state,color):</b>	Clear colorless liquid	<b>Explosion limit lower:</b>	6
		<b>Explosion limit upper:</b>	31
<b>Odor:</b>	Alcohol	<b>Vapor pressure:</b>	128 hPa @ 20°C
<b>Odor threshold:</b>	Not Available	<b>Vapor density:</b>	1.11
<b>pH-value:</b>	Not Available	<b>Relative density:</b>	0.79
<b>Melting/Freezing point:</b>	-98°C	<b>Solubilities:</b>	Miscible at 20 °C



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**Methanol, Lab Grade, 4L**

<b>Boiling point/Boiling range:</b>	64.7°C @ 760mmHg	<b>Partition coefficient (n-octanol/water):</b>	Not Available
<b>Flash point (closed cup):</b>	12°C	<b>Auto/Self-ignition temperature:</b>	455°C
<b>Evaporation rate:</b>	5.2	<b>Decomposition temperature:</b>	Not Available
<b>Flammability (solid,gaseous):</b>	Flammable	<b>Viscosity:</b>	a. Kinematic:Not Available b. Dynamic: Not Available
<b>Density:</b> Not Available			

**SECTION 10 : Stability and reactivity**

**Reactivity:**Vapours may form explosive mixture with air.

**Chemical stability:**Stable under normal conditions.

**Possible hazardous reactions:**None under normal processing.

**Conditions to avoid:**Excess heat, Incompatible Materials, flames, or sparks.

**Incompatible materials:** Oxidizing agents, reducing agents, alkali metals, acids, sodium, potassium, metals as powders, acid chlorides, acid anhydrides, powdered magnesium, and aluminum.

**Hazardous decomposition products:**carbon monoxide, formaldehyde.

**SECTION 11 : Toxicological information**

<b>Acute Toxicity:</b>		
<b>Dermal:</b>	(rabbit)	LD-50 15800 mg/kg
<b>Oral:</b>	(rat)	LD-50 5628 mg/kg
<b>Inhalation:</b>	(rat)	LC-50 130,7 mg/l
<b>Chronic Toxicity:</b> No additional information.		
<b>Corrosion Irritation:</b>		
<b>Ocular:</b>		Irritating to eyes
<b>Dermal:</b>		Irritating to skin
<b>Sensitization:</b>		No additional information.
<b>Single Target Organ (STOT):</b>		Classified as causing damage to organs:Eyes, skin, optic nerve, gastrointestinal tract, central nervous system, respiratory system, liver, spleen, kidney, blood
<b>Numerical Measures:</b>		No additional information.
<b>Carcinogenicity:</b>		Teratogenicity : has occurred in experimental animals.
<b>Mutagenicity:</b>		Mutagenetic effects have occurred in experimental animals.

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**Methanol, Lab Grade, 4L**

**Reproductive Toxicity:**

Developmental Effects  
(Immediate/Delayed) have occurred in  
experimental animals

**SECTION 12 : Ecological information**

**Ecotoxicity**

**Freshwater Fish:** 96 Hr LC50 Pimephales promelas: 28200 mg/L

**Freshwater Fish:** 96 Hr LC50 Oncorhynchus mykiss: 19500 - 20700 mg/L

**Freshwater Fish:** 96 Hr LC50 Pimephales promelas: >100 mg/L

**Freshwater Fish:** 96 Hr LC50 Oncorhynchus mykiss: 18 - 20 mL/L

**Freshwater Fish:** 96 Hr LC50 Lepomis macrochirus: 13500 - 17600 mg/L

**Persistence and degradability:** Not persistent.

**Bioaccumulative potential:** Not Bioaccumulative.

**Mobility in soil:** Aqueous solution has high mobility in soil.

**Other adverse effects:**

**SECTION 13 : Disposal considerations**

**Waste disposal recommendations:**

Methanol RCRA waste code U154. Do not allow product to reach sewage system or open water. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Absorb with a noncombustible absorbent material such as sand or earth and containerize for disposal. Provide ventilation. Have fire extinguishing agent available in case of fire. Eliminate all sources of ignition. Use spark-proof tools and explosion-proof equipment. Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

**SECTION 14 : Transport information**

**UN-Number**

UN1230

**UN proper shipping name**

Methanol

**Transport hazard class(es)**



**Class:**  
3 Flammable liquids



**Class:**  
6.1 Toxic substances

**Packing group:** II

**Environmental hazard:**

**Transport in bulk:**

**Special precautions for user:**

**SECTION 15 : Regulatory information**

**Methanol, Lab Grade, 4L**

**United States (USA)**

**SARA Section 311/312 (Specific toxic chemical listings):**

Acute, Chronic, Fire

**SARA Section 313 (Specific toxic chemical listings):**

67-56-1 Methanol

**RCRA (hazardous waste code):**

67-56-1 Methanol RCRA waste code U154

**TSCA (Toxic Substances Control Act):**

All ingredients are listed.

**CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):**

67-56-1 Methanol 5000 lbs

**Proposition 65 (California):**

**Chemicals known to cause cancer:**

None of the ingredients is listed

**Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed

**Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed

**Chemicals known to cause developmental toxicity:**

67-56-1 Methanol

**Canada**

**Canadian Domestic Substances List (DSL):**

All ingredients are listed.

**Canadian NPRI Ingredient Disclosure list (limit 0.1%):**

None of the ingredients is listed

**Canadian NPRI Ingredient Disclosure list (limit 1%):**

67-56-1 Methanol

**SECTION 16 : Other Information**

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

**GHS Full Text Phrases:**

**Abbreviations and acronyms:**

IMDG: International Maritime Code for Dangerous Goods

PNEC: Predicted No-Effect Concentration (REACH)

**Safety Data Sheet**  
according to 29CFR1910/1200 and GHS Rev. 3

**Effective date : 01.08.2015**

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**Methanol, Lab Grade, 4L**

CFR: Code of Federal Regulations (USA)  
SARA: Superfund Amendments and Reauthorization Act (USA)  
RCRA: Resource Conservation and Recovery Act (USA)  
TSCA: Toxic Substances Control Act (USA)  
NPRI: National Pollutant Release Inventory (Canada)  
DOT: US Department of Transportation  
IATA: International Air Transport Association  
GHS: Globally Harmonized System of Classification and Labelling of Chemicals  
ACGIH: American Conference of Governmental Industrial Hygienists  
CAS: Chemical Abstracts Service (division of the American Chemical Society)  
NFPA: National Fire Protection Association (USA)  
HMIS: Hazardous Materials Identification System (USA)  
WHMIS: Workplace Hazardous Materials Information System (Canada)  
DNEL: Derived No-Effect Level (REACH)

**Effective date : 01.08.2015**

**Last updated : 03.27.2015**